

**Living Seniors Living Rural: Mobile Architecture as a Means to  
Facilitate a New Rural Ageing Typology**

by

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## **ABSTRACT**

With the realization of population trends and the impact the aging population will have on our society, an architectural focus is developing. One that examines the roles seniors play in our built environments. This focus however is primarily oriented to the urban senior, a person very unique and very different from their rural counterpart. My intent is to reach outside the urban study and better understand the position of the aging senior in a rural context, and how architecture plays a role in their development.

The transitions between various life stages are sometimes abrupt, and those forced upon individuals by the aging process may be met with difficulty and surprise. Frequently these changes are impeded by things such as inflexible architecture or poorly planned exterior spaces. Within this thesis the architecture will attempt to counteract the involuntary living in motion that occurs with seniors in rural communities, forced to leave their homes, communities and social networks, by introducing an architecture that is in motion. The built environment will be moving to the seniors or communities where it may be supported.

## **ACKNOWLEDGEMENTS**

Thank you to my thesis committee, Susan Fitzgerald and Niall Savage.

I would also like to thank my parents and family for their support and encouragement throughout this process. Our conversations and family arguments helped to inspire this thesis and the form it took. To my colleges at school whose support in the final days helped immeasurably, Devin Harper, Adi Gerritz, Matt Jones, Dean Dumeresq, and many more, I am incredibly grateful.

In addition, a special thank you to Brian MacLeod and all of his staff at the MacLeod Group. Arranging tours and meetings with operators and staff of existing rural nursing homes and providing feedback to any questions. Your willingness to share knowledge and open up honestly about your experiences in the field helped open my eyes to the reality of being an aging senior in a rural community.



## CHAPTER 1: INTRODUCTION

### Context and Intentions

According to the UN, the elderly population will increase more rapidly than any other demographic over the next 50 years. Specifically in Canada the areas that will most be affected by this increase will be the Atlantic Provinces (Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland), which already have the highest percentage of seniors. This percentage is expected to rise, and will approach 30% of the population of these provinces by 2036. As Deborah Howe writes in the collection of studies *Community Liv-*

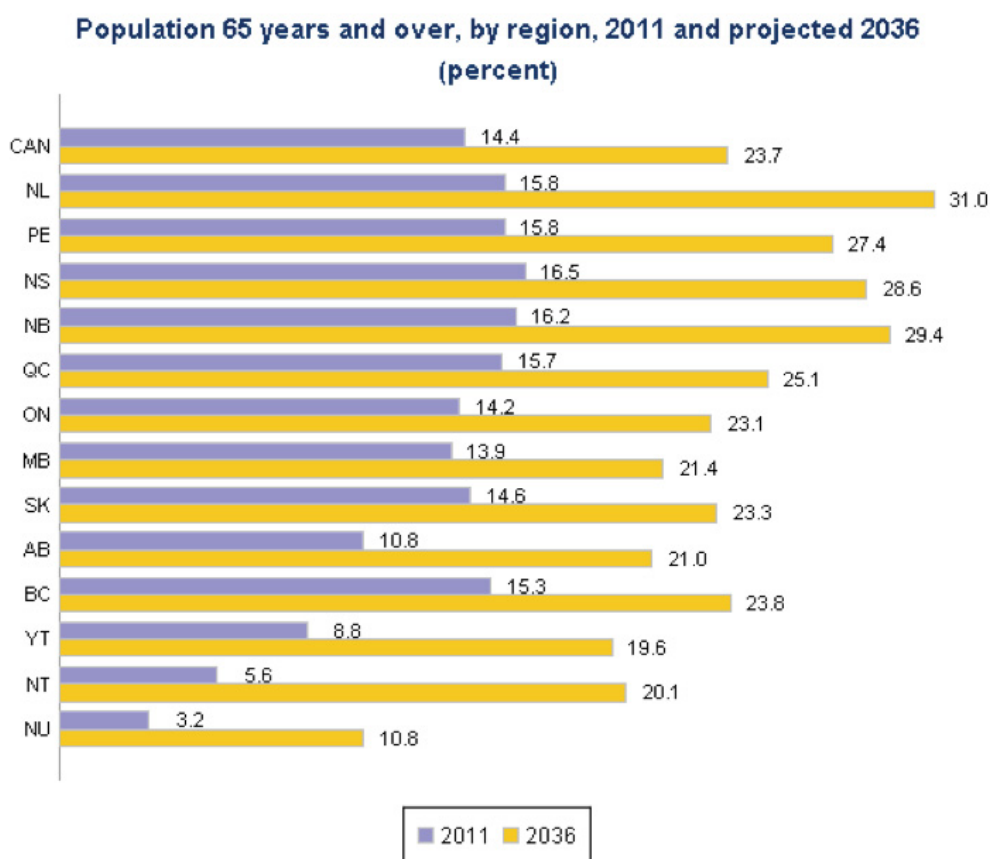


Figure 1: Projected changes in Canadian seniors population over region from Statistics Canada Estimates of population, by age group and sex (Statistics Canada 2011).

*ability*, “The aging of America offers an extraordinary opportunity to critically examine the built environment from the perspective of older people in order to identify obstacles and opportunities for effecting changes” (Wagner 2012, 81). This examination of the existing built environments and the ways in which the aging demographic moves through them both physically and socially is a pressing architectural issue.

In recent years, groups like the World Health Organization (WHO) have been engaged in a global project to enhance community capacity to act as a resource for older adults. The studies however, have been focused on cities, with an age friendly approach that encourages active aging by optimizing opportunities for health, participation, and security to enhance the quality of life as people age and to tap into the potential that older people represent for their societies. Only recently is focus beginning to expand beyond cities, spreading to the many small and dispersed communities where so many older people worldwide live their lives. A deeper understanding of the variety of conditions that exist for seniors within a rural community and the homogeneity of all rural communities needs to be examined. The Director for the Aging and Life Course Programme at the World Health Organization, Alexandre Kalache addresses the issue of rural aging as:

While older adults may be an important resource, they do not always live in settings in which they are able to flourish. And those in rural communities may be doubly disadvantaged. Like others, they require supportive and enabling living environments to compensate for physical and social changes associated with ageing. While some live in idyllic settings, buffered from the social problems of urban areas, many face challenges of poor service infrastructure, isolation, poverty, and harsh climate. They need to be assisted and protected.  
(Keating 2008)

This thesis aims to gain a better understanding of what it is to be an aging resident of a rural community and to challenge the existing stationary retirement home models by developing a new methodology of designing elderly care facilities spaces. A methodology in which the connection and identity the rural senior ties to their community and home is preserved, maintained through a built environment that facilitates the complex requirements of the aging life and allows the resident to remain a part of their community and home is preserved,

maintained through a built environment that facilitates the complex requirements of the aging life and allows the resident to remain a part of their community throughout varying life events.

In the collection of studies *Community Livability* (2012), Deborah Howe, Community and Regional Planning Chair at Temple University, writes in her essay *Aging As the Foundation* the importance of planning which the understanding of the specific needs for the aging demographic:

An aging focus involves putting people into planning, framing a vision that speaks to the very essence of livability. In the extent to which we take actions that give people options for continued independence and provide appropriate levels of support as they age, we are communicating respect for elders and ensuring that they have a place and a role in society. At the same time, meeting their needs involves creating the kind of environment that benefits other community members and achieves other public goals. (Wagner 2012, 85)

## **Defining Rural**

“Approximately 25% of North America’s population lives in rural areas, with older adults being over represented in these areas and their populations growing faster than urban areas” (StatCan 2012).

When initially studying rural communities I realized I needed to address first the idea of what is a rural community. When looking into possible ways to determine if a community was rural, I discovered I could approach this from the objective, density focused definition of rural, or subjective, the socially constructed definition. (Waldron 2014)

The objective definition examines rurality as a distinctive type of locality. It considers the population size, density, and the distance from urban centres. An understanding of the size and dispersal of rural communities allows for the consideration of how rural residents

confront issues of distance. (Keating 2008) However, using objective definitions of rural becomes troublesome when aspects such as population are not consistent. As it relates to my thesis, in Canada the criterion for rural population is fewer than 1000, but in the UK it is fewer than 10000. (Keating 2008) Therefore this definition excludes many people in Canadian communities with populations greater than 1000, such as Wolfville, Windsor, and Antigonish, which are still considered rural by their inhabitants, but not by the definition of Statistics Canada. Considering this, an alternative way to define rural may be adopted.

The alternative definition is one which approaches rural from a more subjective view, looking at rural as a social representation. The focus is on rural as a reflection of a set of attitudes, behaviors and beliefs. Typified as having a slower paced life, close connection to the land, and strong conservative values, and well as an understanding of the rural life and how it differs from the urban experience. In terms of looking at aging as a social representation, few studies have been conducted. Those that have are examining critically the ideas of exclusion of older adults, be it from poverty or social isolation. (Keating 2008)

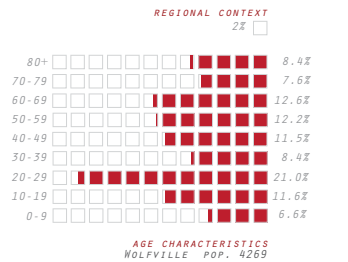
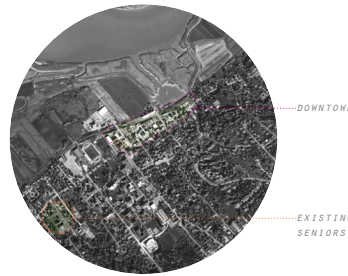
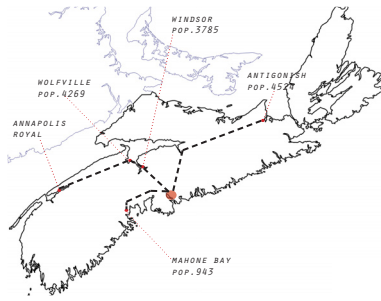
For this thesis the subjective definition of rural was used, looking at the social representation of rural. The focus is on understanding the diversity of experiences and the relationships between the older rural adults and the community setting, and an avoidance of making any assumptions. Considering the tangible and intangible qualities of these communities and how they translate into future development.

An initial study throughout the province of Nova Scotia was conducted, examining the trends in population, development, and the unique rural identities of communities. By examining specifically the trends and uniqueness of each community, potential architectural interventions suitable for rural seniors specific to each were discussed, with the goal being to identify a specific place that would serve as a model by which to test the methodology

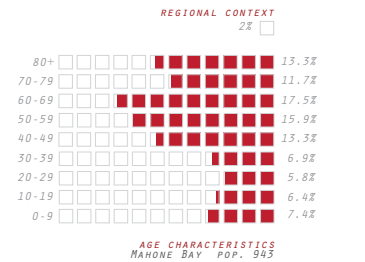
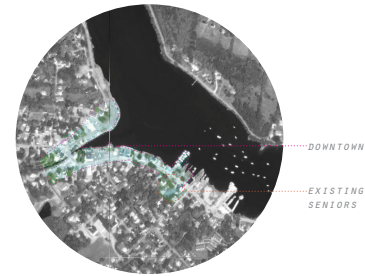
of community specific rural seniors housing developed by this thesis.

**SITE**

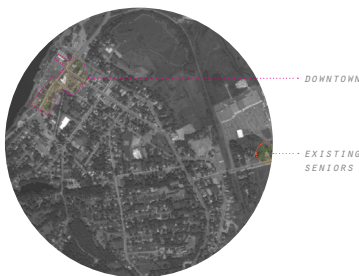
LOOKING AT 5 POSSIBLE RURAL COMMUNITIES AROUND NOVA SCOTIA, LOOKING AT EXISTING SENIORS FACILITIES, THE LOCATION OF THE DOWNTOWN CORES, POPULATION TRENDS, AND COMMUNITY DEVELOPMENT, TO SELECT A SITE THAT WOULD BE ABLE TO SUPPORT A NEW PROJECT. THE DESIRE IS THAT FACILITIES SUCH AS THESE COULD BE SCALED TO ANY RURAL COMMUNITY. THE OBSERVED SEPARATION BOTH PHYSICALLY AND SOCIALLY BETWEEN THE GROWING AGEING DEMOGRAPHIC AND THE REST OF THE COMMUNITY CAN BE BRIDGED THROUGH ARCHITECTURAL INTERVENTION.



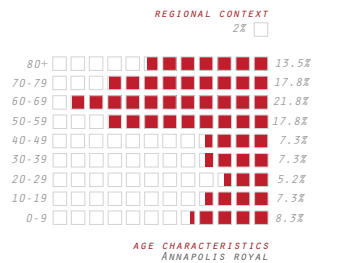
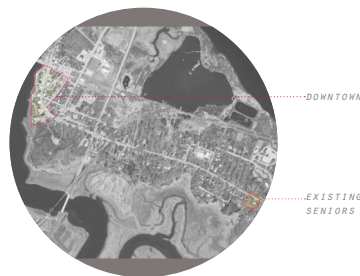
- A COMMUNITY CURRENTLY ON A POPULATION INCREASE (UNIQUE FOR RURAL NOVA SCOTIA)
- UNIVERSITY TOWN WITH THE CAMPUS DIVIDING THE DOWNTOWN AND THE EXISTING SENIOR'S FACILITY
- A COMMUNITY WITH A STRONG DEVELOPMENT PROFILE, PRIME TO IMPLEMENT NEW DESIGN IDEAS
- ABLE TO SUPPORT NEW INFRASTRUCTURE



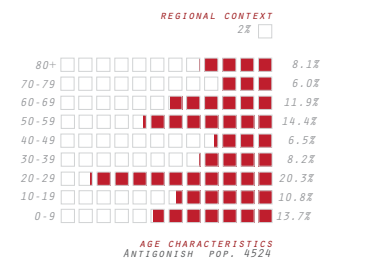
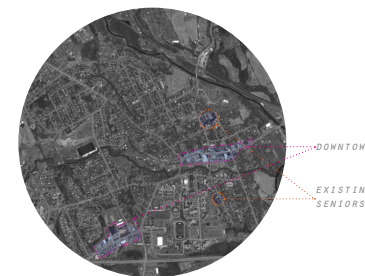
- SMALL COMMUNITY ON A CONTINUING POPULATION DECLINE
- EXISTING FACILITY IS PARTIALLY INTEGRATED INTO THE EXISTING DOWNTOWN
- STRONG TOURIST INTEREST, ARTIST MOVEMENT AND FISHING COMMUNITY. FACILITY WITH ARTIST AND CRAFT FACILITIES / FISHING EDUCATIONAL SPACES MAY FUNCTION WELL.



- A COMMUNITY AT A POPULATION PLATEAU
- EXISTING FACILITIES ON THE OUTSKIRTS OF THE COMMUNITY, DRIVING DISTANCE FROM DOWNTOWN, NEAR HIGHWAY
- WATER ACCESS COMMUNITY, TIES TO FARMING
- WATERFRONT AREA UNDERDEVELOPED, POTENTIAL FOR RECREATION AND COMMUNITY SPACES IN DOWNTOWN CORE



- A COMMUNITY AT A POPULATION DECLINE
- EXISTING FACILITIES ON THE OUTSKIRTS OF THE COMMUNITY, DRIVING DISTANCE FROM DOWNTOWN
- WATER ACCESS COMMUNITY, TIES TO FARMING, HISTORICAL PRESENCE



- A COMMUNITY AT A POPULATION PLATEAU
- UNIVERSITY TOWN WITH THE CAMPUS DIVIDING THE DOWNTOWN
- EXISTING FACILITIES ON THE OUTSKIRTS OF THE COMMUNITY, AMONGST RESIDENTIAL
- A COMMUNITY WITH A STRONG DEVELOPMENT PROFILE WITH THE UNIVERSITY AND TOURISTS, LESS WITH TOWN PROPER
- FISHING, FARMING, ARTS, POSSIBLE PROGRAM

Figure 2: Documentation of community exploration, considering existing locations of community core and senior facilities, community population, and potential opportunities for secondary programs considering community identity. Population by age groups (Statistics Canada 2012). Base maps of Wolfville, Windsor, Annapolis Royal, Antigonish, and Mahone Bay. (Google Earth 2015)

## **Conscious Zoning**

“Zoning regulations that favour homogeneity by separating land uses result in communities where everything is far apart”( Wagner 2012, 85).

As one examines the development of rural communities one can see similarities to the development of many urban centers, as societies which choose the car as the primary form of transportation. There is a focus on a downtown core, which may be developed at a human scale and allows for various forms of transportation, but primarily the community develops at a scale that is dependent on the automobile. With this dependence on the car to access services and events within the community, as the residents age they may no longer be able to rely on that form of transportation, resulting in a loss of independence. Therefore the aging community members may need to move closer within the community or become stranded.

## **Planing Movements & Changes**

To begin addressing the issue of conscious zoning existing planning movements and changes were examined to see if they could be adapted and focused to the aging populations.

### **New Urbanism**

- a reaction to low density sprawl and calls for infill and new development to recreate the pedestrian friendly, compact neighbourhoods that evolved into North American cities before the advent of the car. (Wagner 2012)
- speaks to the rural community in terms of addressing scale, communities with services able to be accessed efficiently without the car, more suitable to seniors.

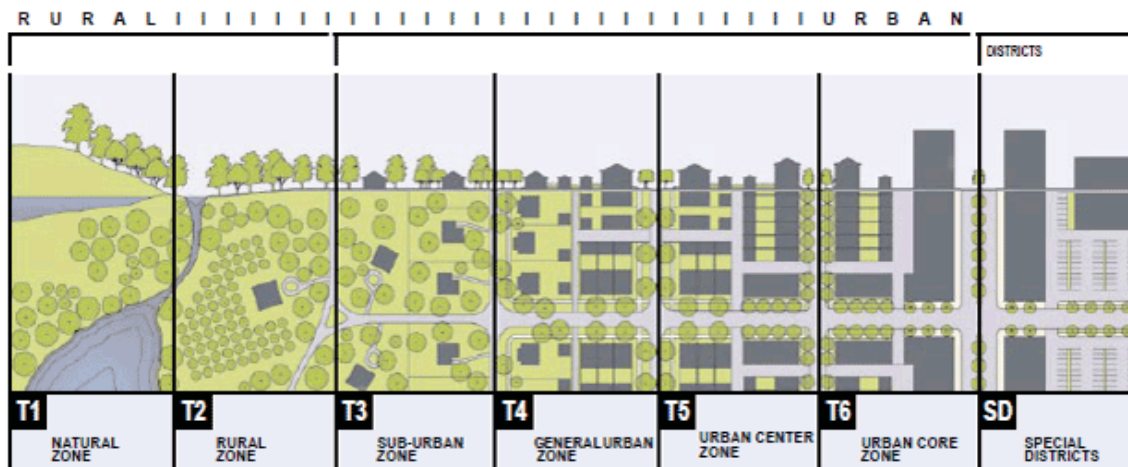


Figure 3: Division of zones or transects designed by Andres Duany, Founder of the Congress of New Urbanism, Each transect is viewed as a way to apply a core set of principles to a range of human habitats. (Duany & Talen 2002)

### Low Density Sprawl

- Rural communities have minimal fixed boundaries and expand out abstractly based on land affordability and industry, with the downtown or core, being small and compact relative to the community at large.
- Rural communities have responded to the automobile and while residents of rural communities used to be self-sufficient and the need to travel for services was minimal, now they rely on the access of services, and the car is the primary way in which they get to these services.
- To rework these communities for seniors, the idea of returning to the pedestrian friendly, compact neighborhoods before the car is an important step when siting a facility.

### Downtown Tide

- Another indicator that changes need to happen in zoning and development practices with respect to seniors is the driving trend of leaving suburban neighborhoods and moving to downtowns where they can enjoy rich cultural activities and other amenities that are emerging with urban revitalization.



- This is adding to the demand for high density housing alternatives. (Wagner 2012)
- The elderly are recognizing that as they age, changes in their abilities and mobilities will impact how they are able to live, and are actively seeking out living alternatives that will allow them to remain active longer, as well as be independent longer.
- This introduces the question of how this trend of retirees moving to the downtowns functions in a rural context.

Considering these planning movements, rural zoning, and the trends and desires of aging seniors, the siting of new facilities will need to be a considered and specific selection. Unique for each community and responding to the abilities of its residents.



Figure 4. Initial photo study of a potential site, Windsor. Examining the existing density of the community core, and looking for opportunities to highlight the community or for new architecture to infill and create higher density.





Figure 5. Initial photo study identifying the edge conditions of the Wolfville community and highlighting the area of potential program. An area that speaks to the roots of the community, the community identity as an agricultural area. Connecting community core to community identity.

## Site

An initial examination of the existing living conditions of rural seniors in Nova Scotian communities showed opportunities for architectural interventions to allow for some form of aging in place. Further examination leads to a definition of ideal siting for new aging members to come together when need dictates and inhabit the community as a collective. Emphasis is placed on ways in which the architectural interventions of both aging in place and aging as a collective can integrate all members of communities and inform new perspectives towards the growing aging demographic. The intent was to use the study of a specific community, Wolfville, NS, to create a methodology by which the optimal siting, program, and scale of elderly living communities can be determined for any rural community that respond to the specific identities of the community and its residents, promoting development and engagement. With this methodology a new typology of elderly care facilities can emerge, one in which the aging population is at the core of the community both physically and socially, as opposed to the periphery. As well one in which the facility itself adapts and moves with the life cycle of the aging senior, providing opportunities for both aging in place and aging as a collective.

**Selection**

Wolfville, NS, is a progressive rural community that is striving for development and change. With a largely educated population due to the presence of Acadia University, it has a youthful group of innovators actively seeking to experiment and better represent their town. This provides an environment willing to embrace a new form of development such as an active seniors community within the town's core. The identity of the community is strongly tied into its agricultural heritage, as is much of its recent innovation, this provides the opportunity for secondary program with the senior's housing. Senior's remaining active and engaged through surrounding farming and the agricultural surround.

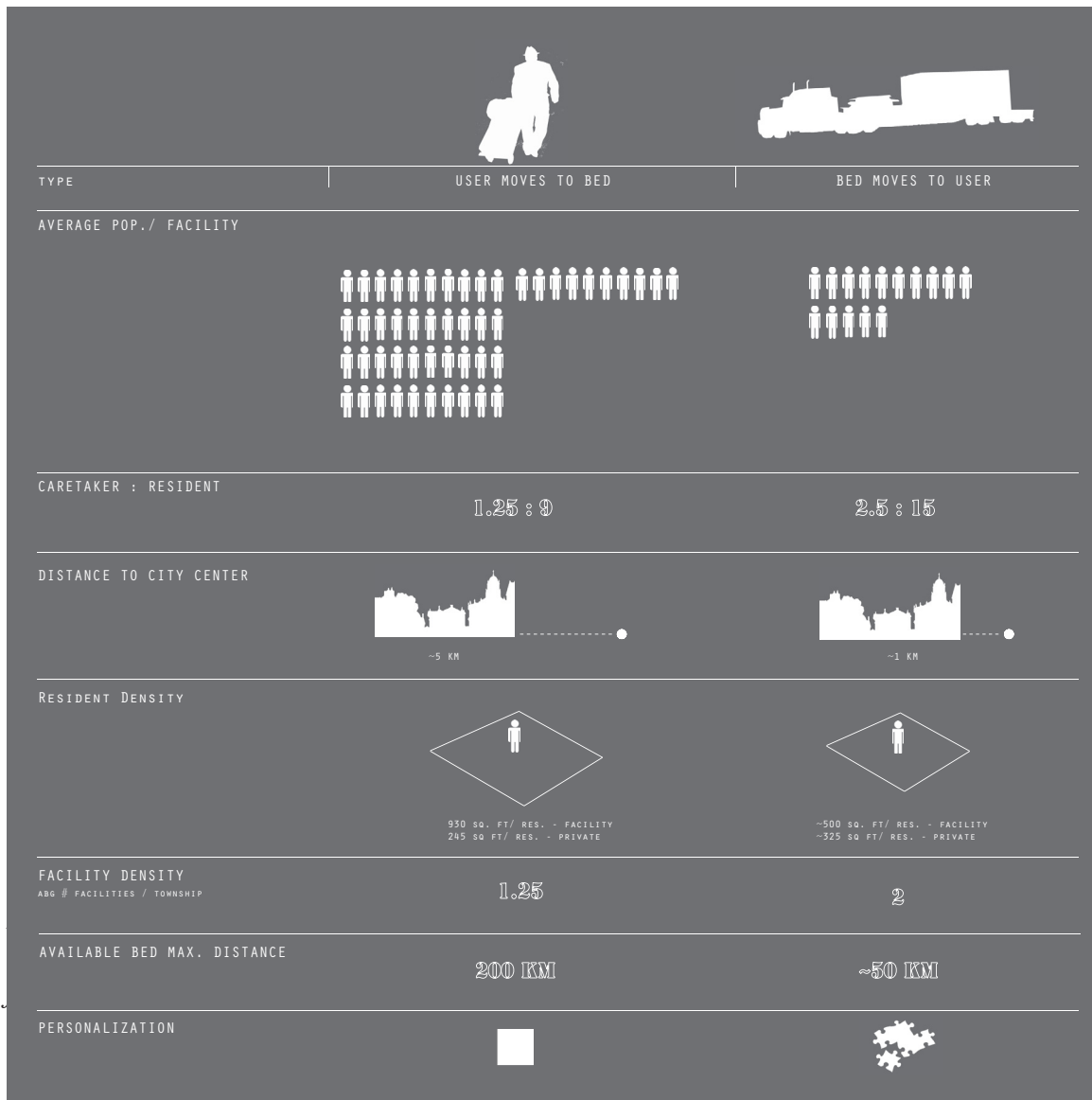


Figure 6. Diagram exploring issues and data related to existing rural seniors housing and proposed new housing alternative which moves with seniors changing life. (Department of Health and Wellness 2015)

## **Characteristics**

Within each community, site selection must begin by sourcing a site that provides opportunity for connection, by proximity, and also by activity. In the case of Wolfville, the potential site borders the downtown edge and the opportunity for activity comes from considering the strong agricultural identity of the community. There is an opportunity for surrounding farming and micro-farming to be a good recreational activity for active aging, while also providing opportunities for engagement via a market/green space. In the case of a potential site, the characteristics of the community can be examined so as to better understand the identity of the area and the community at large. Site factors include:



## Fertile Land

- The arable land borders the downtown of Wolfville and the Cornwallis river. This land is unique in that it was created hundreds of years ago by an extensive network of dykes converting marshland into incredibly fertile land that has been farmed successfully for centuries. The type of land and the climate in this portion of Nova Scotia provides an excellent growing season capable of supporting a large variety of crops. Wolfville also is a primary supplier of much of the province's local agricultural products. With this specific site being so close to the community core, it is an opportunity to bring the area's farming knowledge into the community center. As well, the dyke walls provide opportunity for recreation for both seniors and the community at large, an area with limited accessibility currently.



Figure 8. Wolfville, NS, arable land.



### Edge/Landform

- The site runs along the edge of two primary land development types in this rural community, arable land and commercial land, providing opportunity for connection and program to work within both land types.

### Existing Green Space

- Small pockets of existing green space exist around the community core. The primary and junior school is only a few blocks South of the core. The proposed site has an opportunity to provide outside recreational spaces that can be enjoyed by both the elderly residents and the greater community.

### Community Core

- The site is less than two blocks from Main St., Wolfville. This close proximity to the community core, both recreational and commercial, and it's users is a key asset to the proposed site. This proximity is such that the residents of the new facility can access the services in the core with a greater ease, but also that the actions that go on in the new facility can help to create and continue development. In this core many businesses and facilities that would be used by the aging population are present, as detailed in *Figure 7*.

### Trails & Paths

- Access around the site is also available via the existing trails that border and cut through the proposed site, the dyke walls. These paths are level enough that the new elderly users can use them as a way to facilitate active aging. As well the dyke walls provide opportunity for recreation for both seniors and the community at large, an area with limited accessibility currently.



Figure 9. Wolfville, NS, Dyke walking paths.

#### Access

- Access to Wolfville is by two highways, the Trans-Canada, which borders the southern edge of the community, and Hwy #1, which becomes the Main St. of Wolfville and many other communities in the valley. Main St. is also where the public transportation of Wolfville runs, a bus route between adjacent communities. The proximity of both public and private transportation types to the site provides many opportunities for people from around the community, and adjacent communities to interact with the residents and visitors of the new seniors facility.



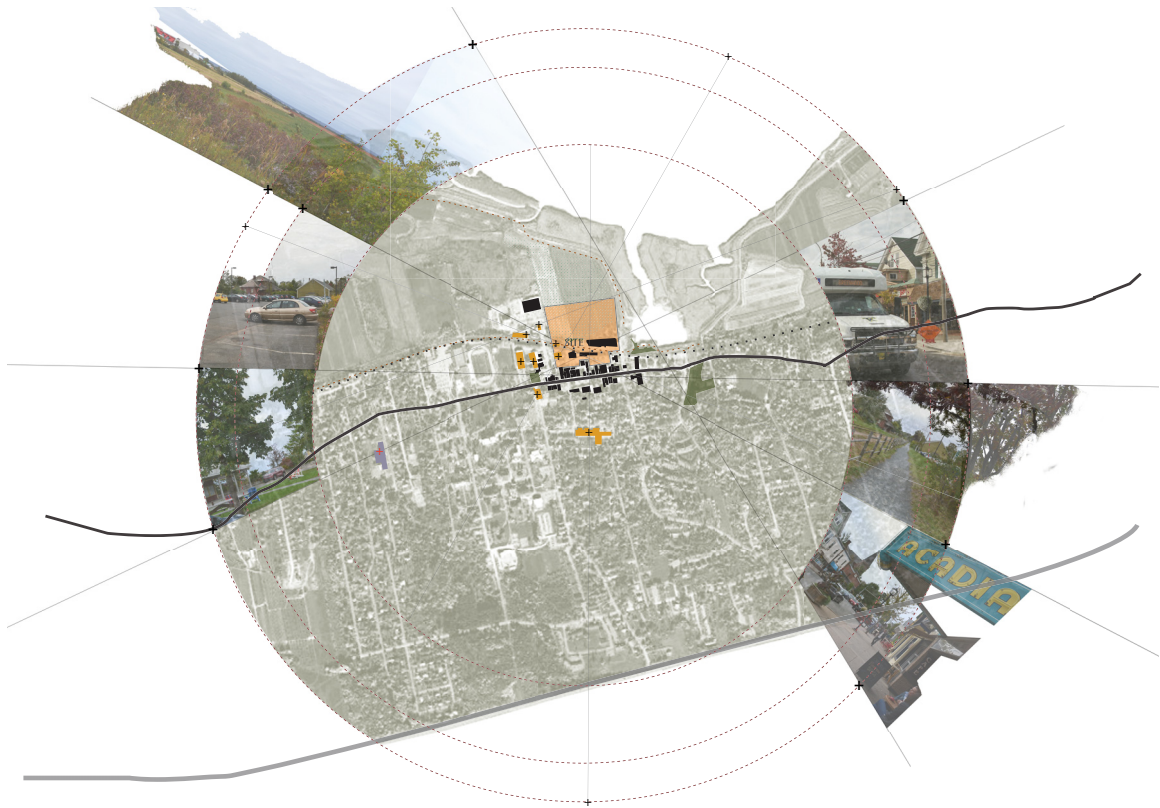


Figure 10. Initial collage examine the assets of the potential site. (Google Earth 2014)

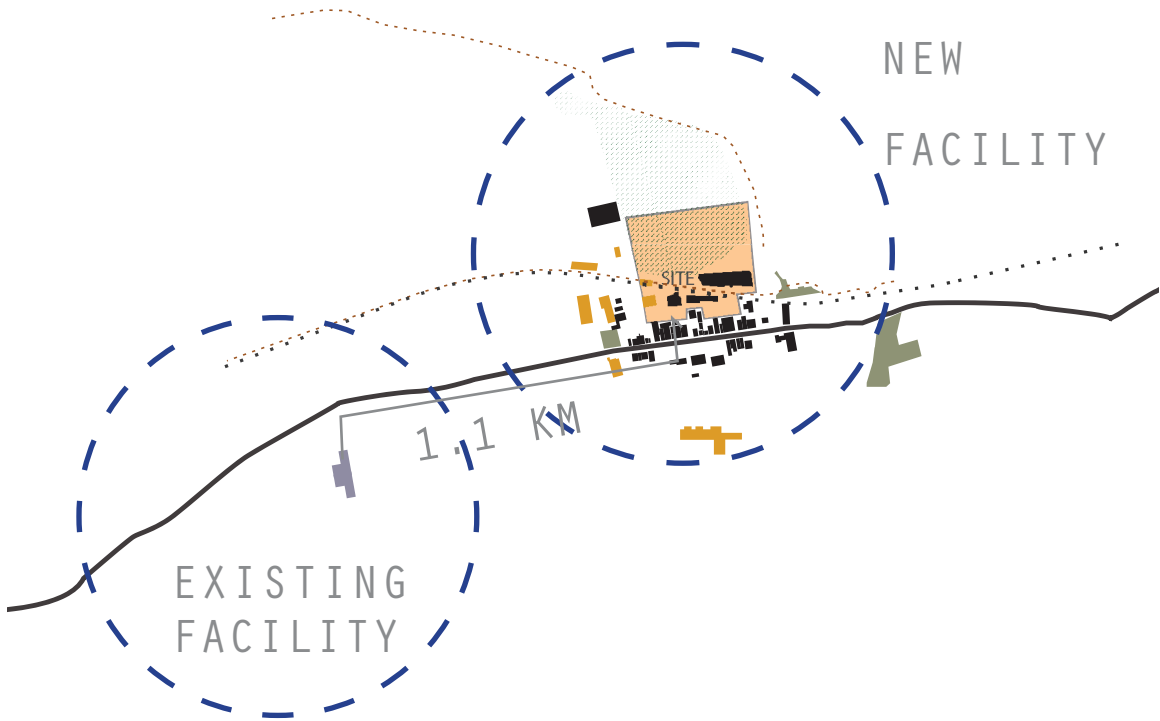


Figure 11. Diagram of proposed new site in contrast to location of existing seniors facility.

## **The Program**

With the intent being to closely knit the aging seniors into the community and creating opportunities for the seniors to remain active and part of their community the program of the proposed architecture can not be separated from the program of the community. Attention must be paid to what services and activities are available near the proposed site and which would be accessible and which would not, as the intent to connect the aging population to the town not segregate them further. Based on conversations with residents, staff, and coordinators of existing seniors facilities, programmatic studies were conducted to better understand what are activities that are of interest to seniors and what are the spaces and times these spaces are in use.

From these studies as well as an examination of the services and provided within the town core and within transit distance, optimal siting for collective senior living can be determined.

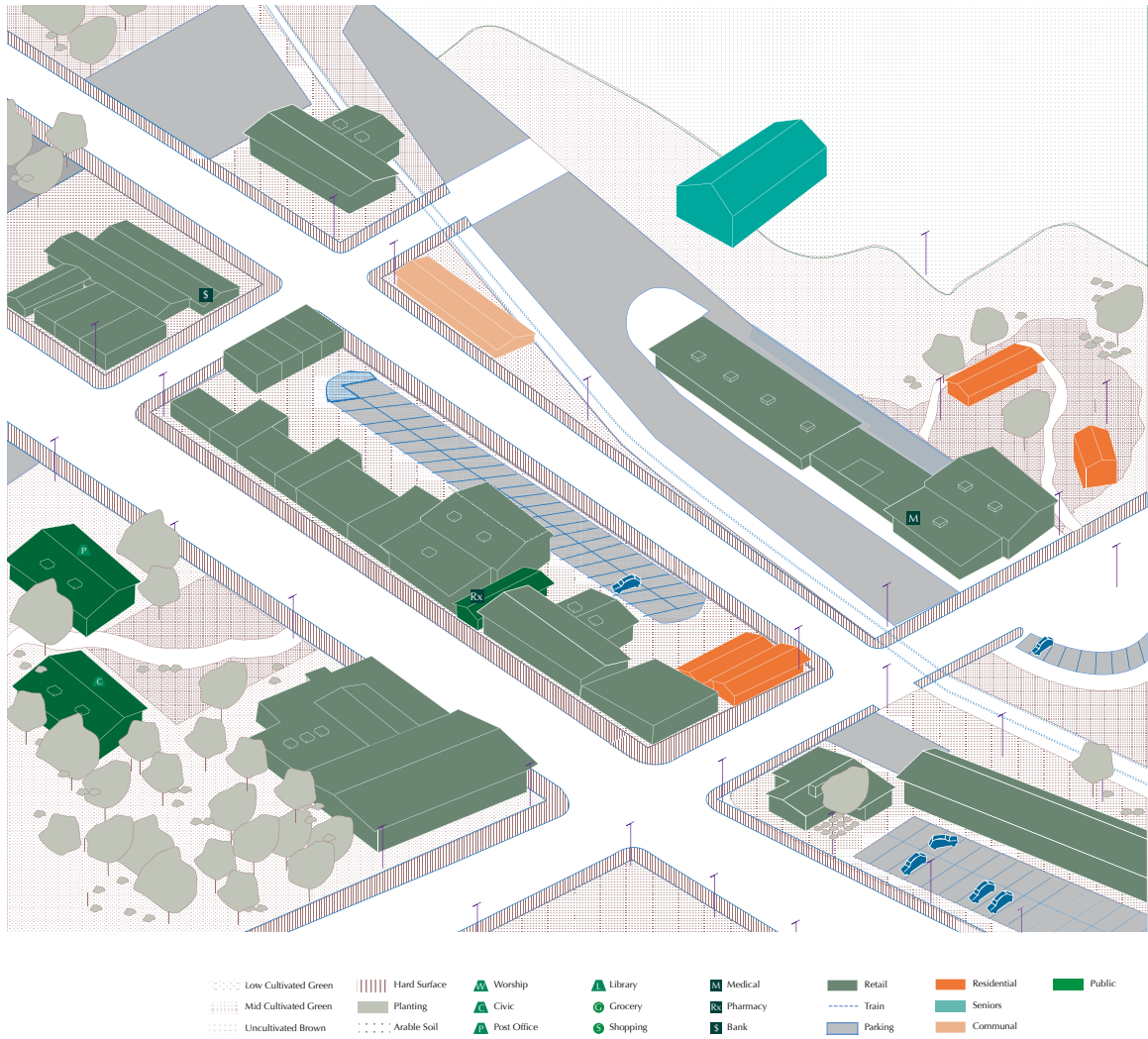


Figure 12. Diagram of proposed new site within the community core.

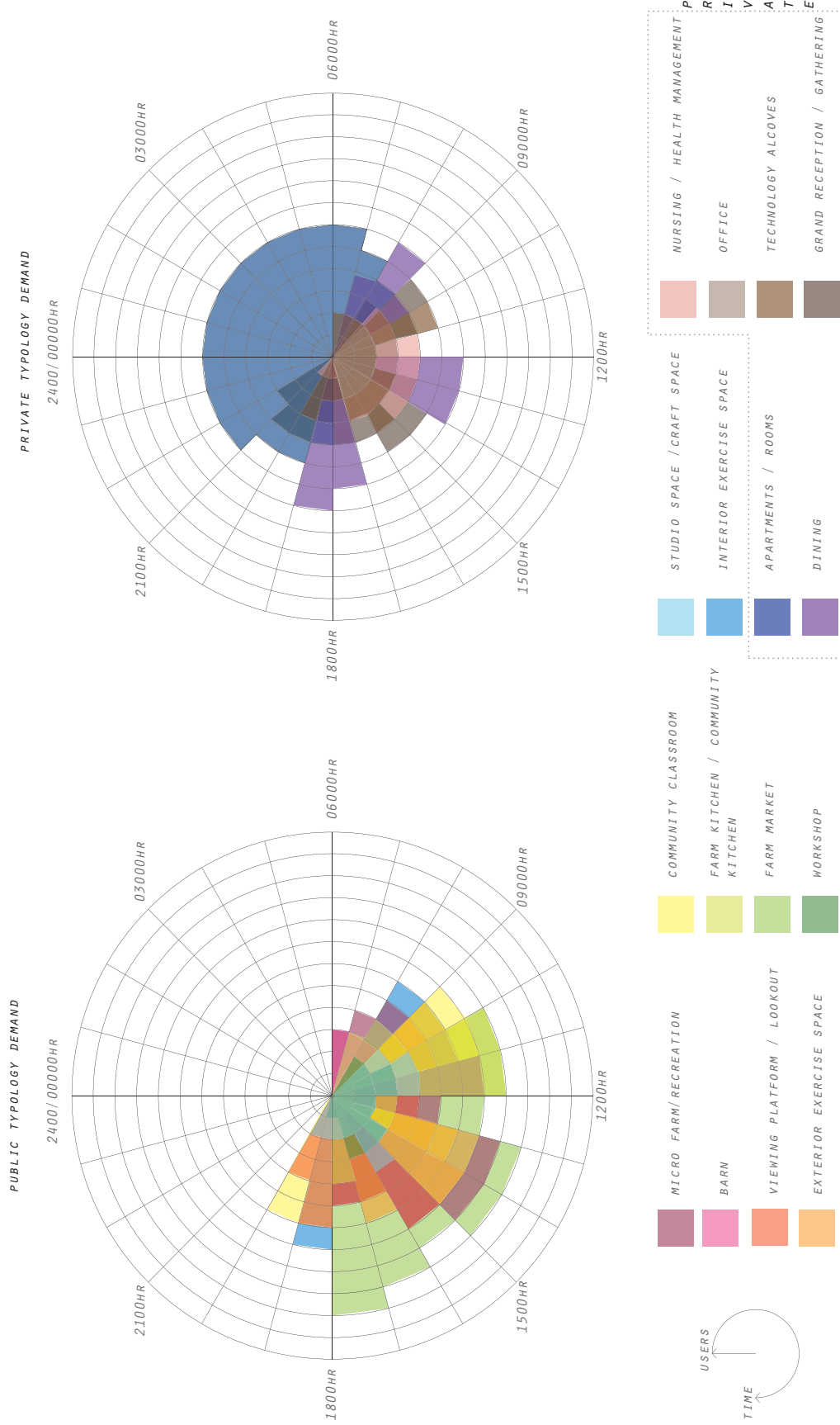
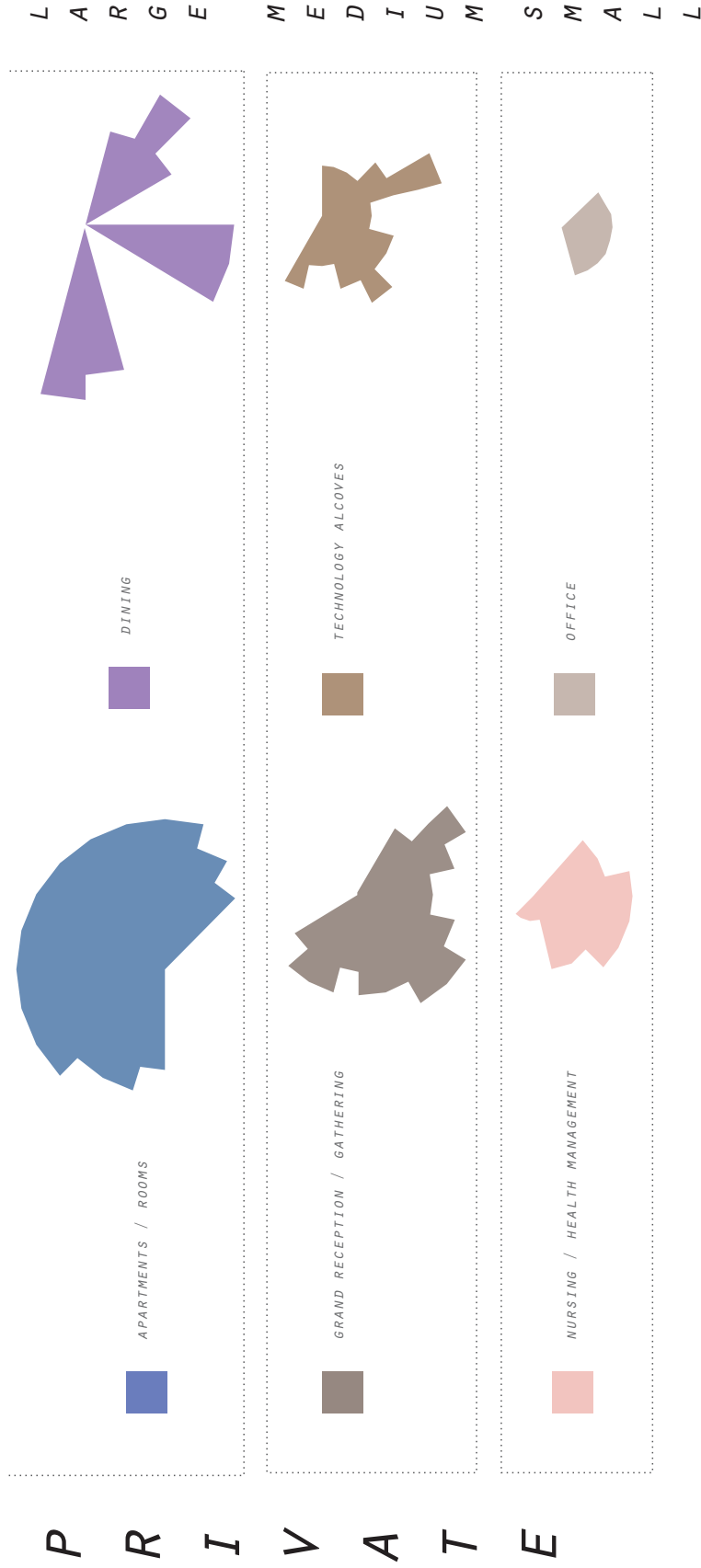


Figure 13. Diagrams examining the program in relation to time, 1 day, and users. Looking at both public and private typology demands, examining opportunities for community engagement and volunteering/assistance are able to take place.



**SCALE OF SPACES AND SPATIAL ARRANGEMENT**

- LOOKING AT THE USERS REQUIREMENTS FOR EACH SPACE AS WELL AS THE TYPE OF USER, I HOPE TO USE THIS TO FIND OPTIMAL SPATIAL ARRANGEMENTS.
- LOOKING AT THE PROGRAMMATIC ELEMENTS THROUGHOUT THE DAY, AS WELL AS THE NUMBER OF USERS, WITH THE INTENT TO SEE WHAT SPACES CAN HAVE MULTIPLE PROGRAMMATIC USES.
- THE DEVIATION BETWEEN PUBLIC AND PRIVATE IS QUITE LOOSE, THE HOPE IS THAT MOST SPACES CAN BE USED BY COMMUNITY MEMBER WHO DO

Figure 14. Examining the results of the previous study to determine how many users and for how long each program would be occurring, in order to examine the importance of each program and to derive an idea of what spaces can be designed for multiple programs and also program adjacency.

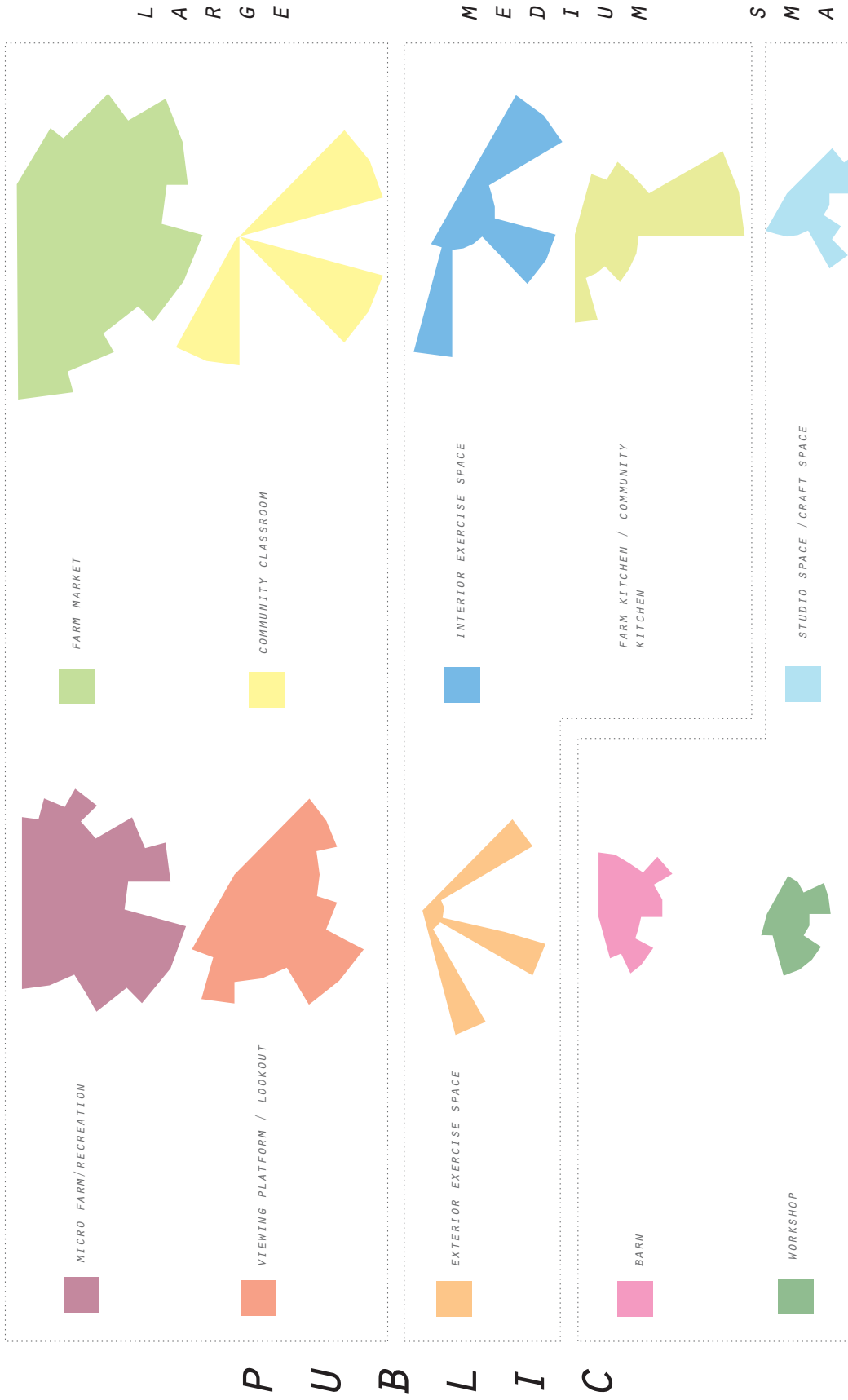


Figure 15. Examining the results of the previous study to determine how many users and for how long each program would be occurring, in order to examine the importance of each program and to derive an idea of what spaces can be designed for multiple programs and also program adjacency.

## SEASONAL DEMAND

WITH A PRIMARILY AGRICULTURAL PUBLIC PROGRAM LOOKING AT SPECIFIC ASPECTS OVER THE SEASON AND THEIR USER DEMAND WILL HELP TO BETTER UNDERSTAND THEIR FUNCTION AND ROLE WITHIN THE ARCHITECTURE.

LOOKING AT A PROGRAM WITH A STRING EXTERIOR FOCUS, THEIR IS A FOCUS FOR MORE USERS INT HE SUMMER MONTHS. THOUGH OTHER ASPECTS OF THE PROGRAMS SUCH AS COMMUNITY KITCHEN AND MARKET CAN FUNCTION YEAR ROUND. ALSO WITH AN AGRICULTURAL PROGRAM MANY ACTIVITIES AND PREPARATIONS CAN GO ON DURING THE WINTER MONTHS TO PREPARE FOR THE GROWING SEASONS.

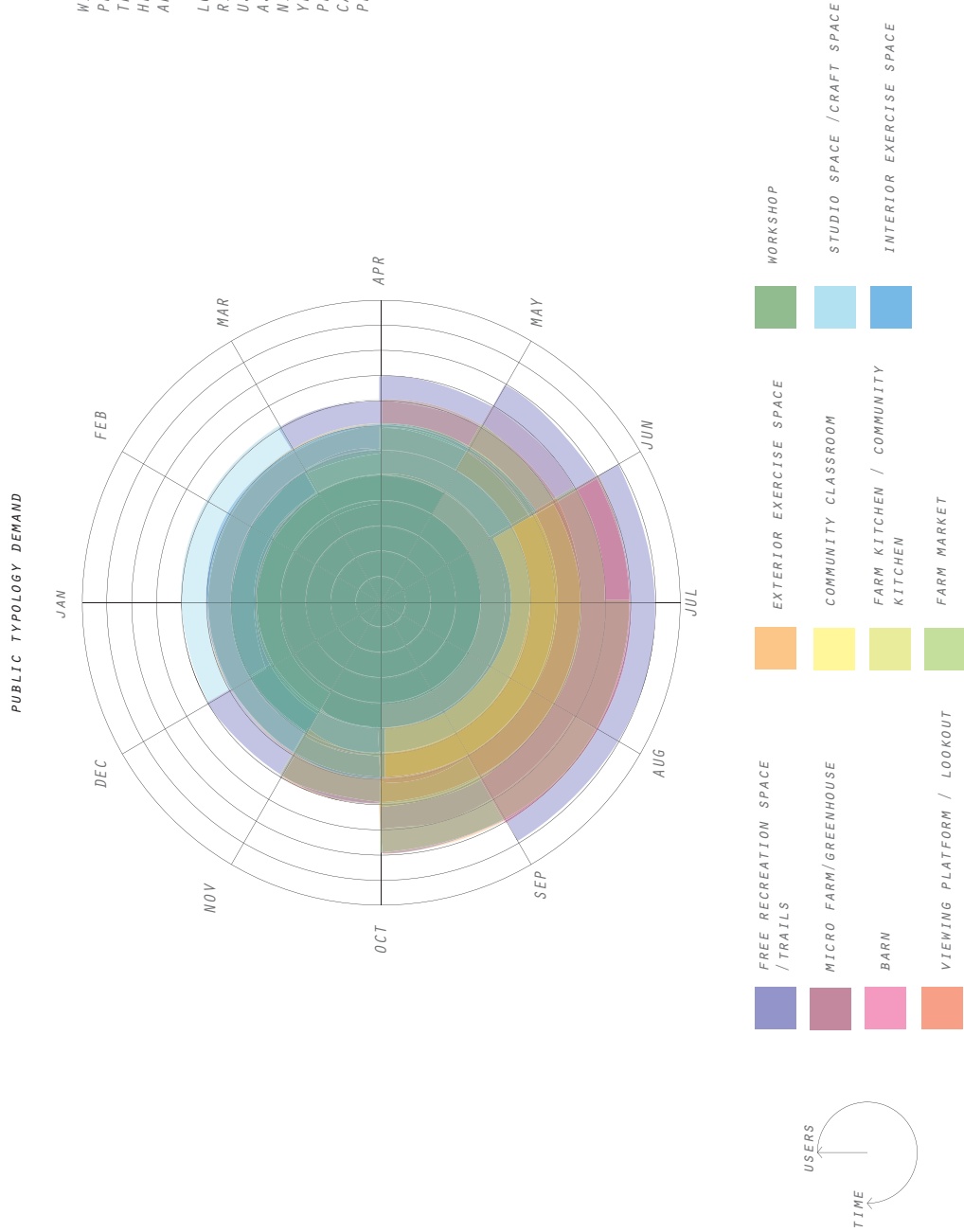


Figure 16. Diagrams examining the program in relation to time, 1 year, and users. Looking at both public and private typology demands, examining opportunities for community engagement and volunteering/assistance are able to take place.

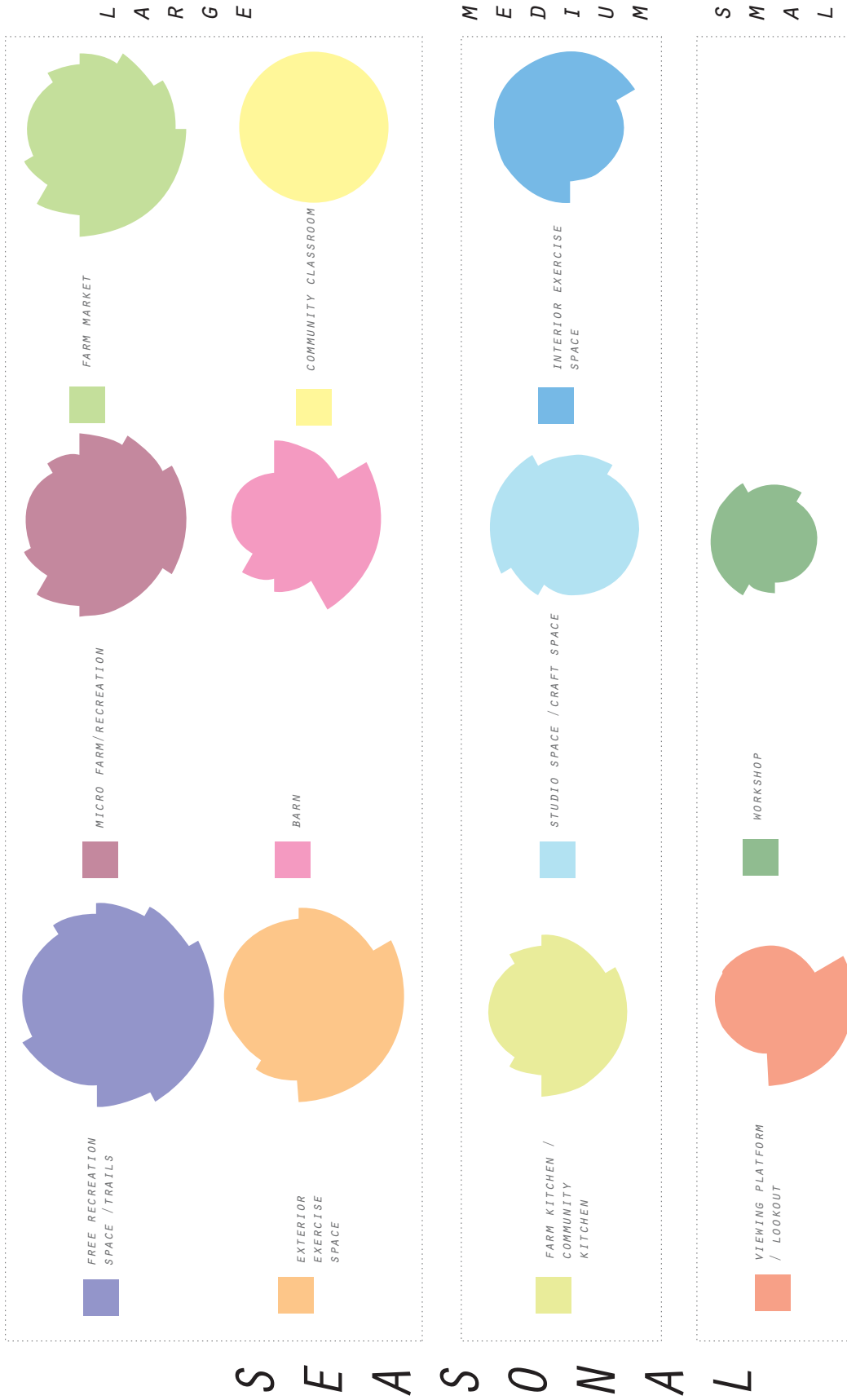


Figure 17. Examining the results of the previous study to determine how many users and for how long each program would be occurring, in order to examine the importance of each program and to derive an idea of what spaces can be designed for multiple programs and also program adjacency.



## **Identity of a Rural Community**

In eastern Canada, closure of shipbuilding and fishing industries has led to the withdrawal of other services and a similar decline in employment opportunities. A typical comment about these changes comes from a resident in a small coastal village. She bemoaned the fact that trains no longer stopped, coaches did not come and services were disappearing, summing up her views of community decline by remarking that one day soon even the tide would not come in. In such places, ageing of communities has resulted in fewer resources to support increasing proportions of older residents. (Keating 2008, 126)

As described by this rural Eastern Canadian resident, one must consider that there are dying and thriving communities. The roots, the culture, and the residents of the community are shaped by the industry and actions of the specific community. When that industry leaves, if new the community pursues new development or does not, determines the survival of the community and with that, the identity of it's residents. The notions that these communities are desolate with few opportunities, and that the move to the urban is the proper move for the population if they want change and variety, is what needs to be addressed. New development within a rural community is possible. There is a need to deconstruct the impression of rural places as "hinterlands bereft of opportunity and socially and culturally lagging or of idyllic pastoral settings" (Keating 2008, 121).

Rural communities are both idyllic and difficult, just as older rural residents are both resilient and fragile. When these communities experience change and struggle, how the residents respond, and how the introduction of new architecture can assist in the revitalization of the community and continue development is a focus of this thesis.

### **Identity of Wolfville**

Within Wolfville, the study community, examining the site, the culture, the historic, and natural development of the community in order to find a secondary program that would support development and encourage community engagement as well as promote healthy

active aging was key. “Connections between rural places and the beliefs and behavior of those who live there. It is at the interface between these sociocultural elements of rural, and the placed-based characteristics of rural communities, that we gain a deeper understanding of the ‘constructed’ as well as the structural elements of rural”(Keating 2008, 124).

A study of the site found an agricultural heritage of the community and it’s residents, the opportunity to build on arable land at the edge of the downtown core, and a community striving for development. Along with a large young educated population who are committed to the revitalization of their community, a community striving to advance their knowledge of agricultural practices, and a tourist industry based on the heritage of the land, new architectural development that responds and develops with this at the forefront is most fitting. This study led to the decision that micro-farming surrounding the new senior living collective could continue to engage the new residents in the identity of the community while potentially creating opportunities for the seniors to engage in this practice as well.

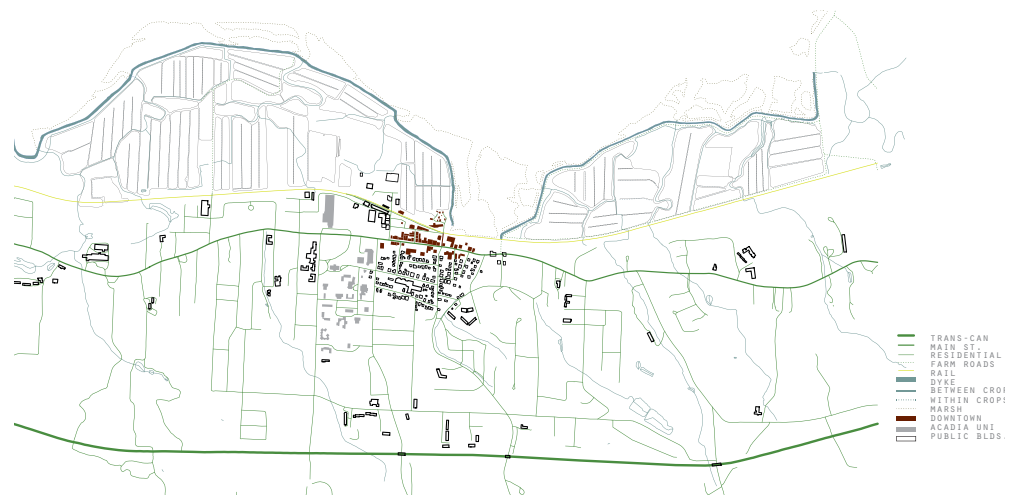


Figure 18. Diagram outlining community factors.

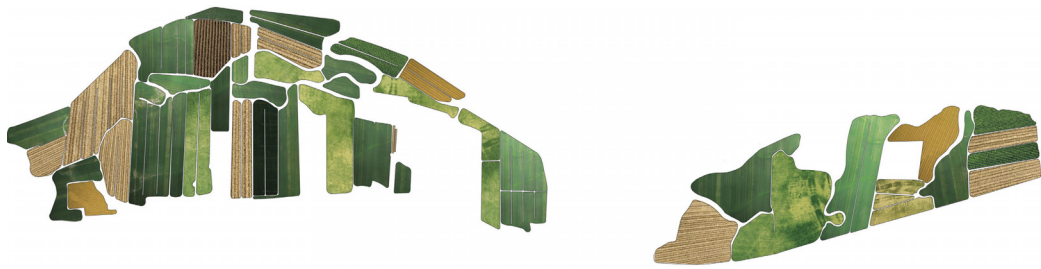


Figure 19. Diagram outlining crop patterns, variety and orientation relating closest to drainage patterns.

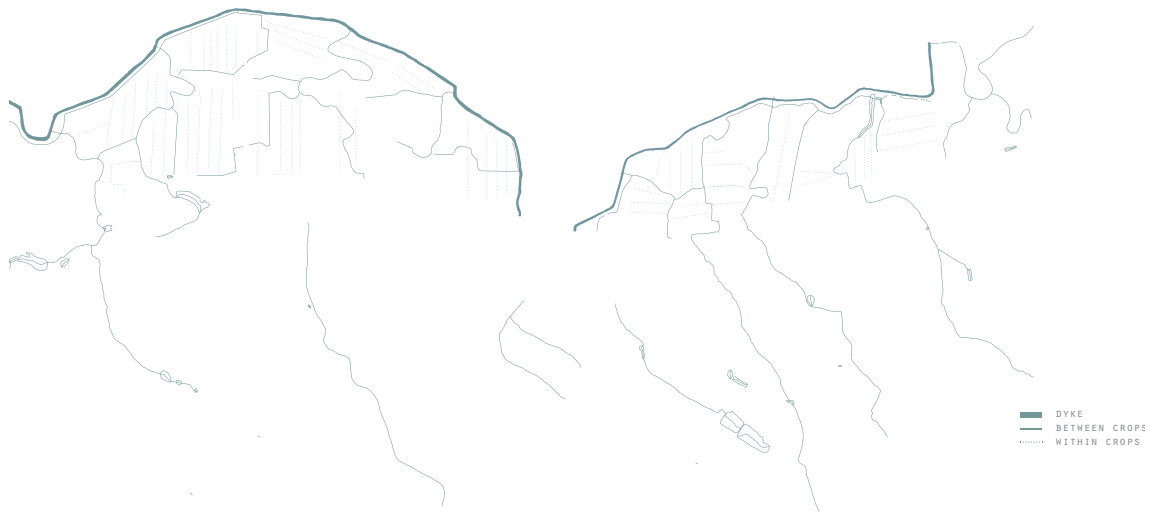


Figure 20. Drainage diagram that creates a hard edge. The large scale farmers drain defines the crops and the smaller scale drains within crops.

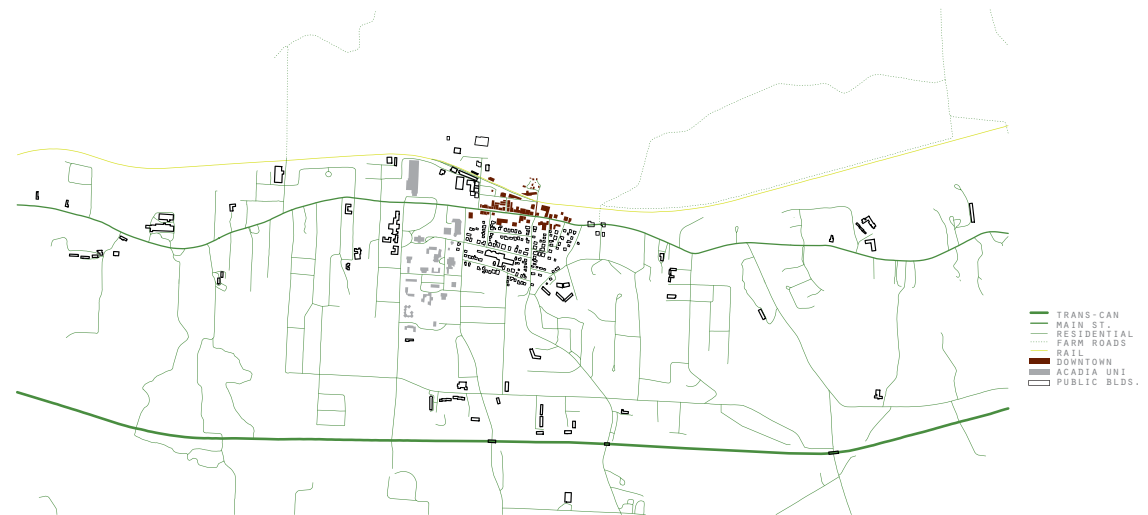


Figure 21. Community diagram which shows how the site meets the community core, outlines the building scale change due to the proximity to Acadia. Also shows the railroad track that runs along the edge between built and arable land.

## **Heterogeneity of People Later in Life**

“Experiences of aging are diverse, and that understanding this diversity requires an expanded consideration of aging in various contexts. Rural is one such context” (Keating 2012, 121).

To understand the primary user group of this thesis one must have a deeper look at the range of seniors. Examining aging along the entire process of aging and from an intersectional approach considering age, race, gender, socio-economic status, ethnicity, and culture. This approach allows one to get a better consideration of the needs and desires of the members of the community at all stages of their aging, and find opportunities for the new architectural interventions to have the most impact, not just on the seniors already at a point in their lives where facilities are necessary. (Waldron, 2014) But to also consider anyone who is aging in the community and how and when they are able to utilize the architecture, to allow them to age within their homes longer or to help them adjust to collective living opportunities.

“An individual moves within an environment through a series of links from one place to another...” (Wagner 2012, 86). Considering navigating these links may create challenges depending on the abilities and disabilities of the user and are often overlooked. Focusing on links such as sidewalk quality, benches and shade is an important aspect to developing a community that is able to support the diversity of the community population.

Outside of the aging residents person support or range, each have an outside network of support as well. While there is evidence that rural communities have strong relationships with friends, family, and community members, one needs to consider that aging rural residents are not homogenous and some of them will not have the same broad network of

support if illness or disability occurs. Therefore the need in these communities for programs, organizations and community assistance to be put in place is a necessary one.

Through a deeper understanding the physical range of the ageing population and the movement of the seniors around the site and the larger community, a scale of intervention or assistance needed can be determined. This understanding becomes crucial with the organization of the program around the site, so that the necessary services are all within a range that is usable by all, and then the secondary programs would be spread out from this. A design focus of providing opportunities to design for various levels of users and create special design moments for each to interact with the landscape and the community.

### **Implications of Change**

As Dr. Antje Flade explains, a researcher of aging and mobility, “Changes in peoples lives have their origin in the individuals themselves who on one hand bring about changes through their actions, but on the other must also accept the changes forced upon them by the ageing process” (Schwartz-Clauss 2002, ). In order to understand the range of movement of seniors within a community, one needs to recognize varying physical and mental limitations that may develop, as well as understand that aging is unique and will be embraced by each aging person differently. “Older rural adults think about the possibilities of the onset of chronic illness and whether their communities will have the services they may need to support them. Some anticipate leaving their communities should their health needs increase, while others choose to live with increased risk in order to stay in familiar settings” (Keating 2008, 125). In examining how these changes effect the persons relation to the built environment, Dr. Flade suggests that change is inherent over the course of life owing to biological process, and people live in an environment in constant motion with change as the defining characteristic of human existence.

Amongst an ever changing environment the most significant environment in ones home, where the bonds to it may not merely be functional but also emotional. These bonds can be impeded, however, by such things as inflexible architecture or poorly planned exterior spaces, which limit the way these changes can be met while remaining in one's home.

## **The Dwelling & The Resident**

Sociologists of housing pose questions such as: "Why do people live a certain way, how do they live, and what are the ramifications?". In sociology the assumption is that residential structures constitute social structures. A family is established that expands and then ultimately shrinks again, until finally an "empty nest" and then perhaps just one partner is left. The transitions between various life stages are sometimes abrupt, which can lead to problems as new adaptations become necessary. These transitions or "critical life events", interrupt the everyday cycles of life and necessitate adjustments. With regards to rural seniors, what does it say about the social structure of the senior who leaves home, potentially leaves their community, and moves to a facility on the outskirts. Where is the social structure for the senior, when the senior's residential structure is changing? Involuntary living in motion may occur in which the seniors needing to leave their homes, communities, social networks. In the case of relocation, one must consider that relocation is a spatial, outwardly visible change of place and that the everyday environment of the senior is altered in both physical, social and psychological terms.

In the American classic *The Grapes of Wrath*, John Steinback illuminates the ties of our identity to our living environment, "How can we live without our lives? How will we know it is us without our past?" (Steinbeck 1938). As Dr. Flade explains, from a psychological perspective, a relationship exists between the individual and the environment in

which they dwell, the two are connected and influence one another. When a “critical life event” occurs and the senior must move or significantly change their environment, a vital consideration is how the change is met by the individual.

Particularly in the case of the aging person, whose physical and mental faculties are so sensitive, change is a significant hurdle not easily overcome, that frequently hinders health as opposed to assists. (Waldron 2014)

In considering these aspects of “change” and “critical life events” and how both affect the dwelling of the aging senior and the health, a vital consideration for this thesis emerged, one in which the mediation between these subjects is done through architecture. Through the development of an architectural constant, an attempt will be made to create an environment for dwelling that adapts and moves with the resident as their age and health changes, but yet allows the resident to keep a portion of their dwelling a constant and unique to them. Architecture, so that with mental and physical degradation or change, the resident still knows it is theirs.

## **Community Involvement**

Characteristics of rural places also influence the ways in which people become engaged in their communities. Because of their small size and distance from larger centres, rural communities often have few human resources and a tenuous service infrastructure from which to provide services and support to others. Rural residents respond by engaging in volunteer activities and community organizations at higher rates than urban dwellers. They do so despite chronic health problems and disabilities, even when this engagement places high demands on their own time, money, and physical resources. (Keating 2008, 122)

Within rural communities, higher rates of volunteering are associated with community characteristics that foster the emergence and development of volunteer organizations and opportunities such as a higher proportion of older adults and of highly educated people. The community of Wolfville is one such community with the higher proportion of highly

educated people and community organization that fosters that idea of community involvement and volunteering. Making it a stepping stone for new community architecture and programs to take off and to be adopted by other communities. “People believe that small rural settings allow them to do things that they would not be able to do in a larger place, which would require a higher level of knowledge and skill” (Keating 2008, 123). Residents of rural communities believe their assistance is needed by their community, and that engagement is both necessary and possible in a rural setting. Though we must consider that in these small rural communities with low population densities and a lack of community infrastructure, the residents compensate by being caregivers to others and volunteers as there is no other alternative. By the introduction of a new elderly care facility with a secondary community identity program, the idea of creating opportunity for volunteering and care-giving evolves to create opportunity for other forms of interaction and activity.



## CHAPTER 2: DESIGN

### Concept

Through the creating of a mobile architecture or pod, which supports and adapts to the needs of the aging user, an architecture is developed that allows the user to remain at home as long as possible with opportunities for visiting support, and accessible spaces. Each pod is comprised of pieces which allow for nursing care, rest, bathing, and workspaces to create an independent environment that is accessible for the user when their original home may not be.

When the limitations of health deem it necessary for a greater level of care the rural senior may relocate their residential pod to the collective housing armature that will support the resident both physically and socially. The pods will be moved by truck to the facility or to the community where they are needed.

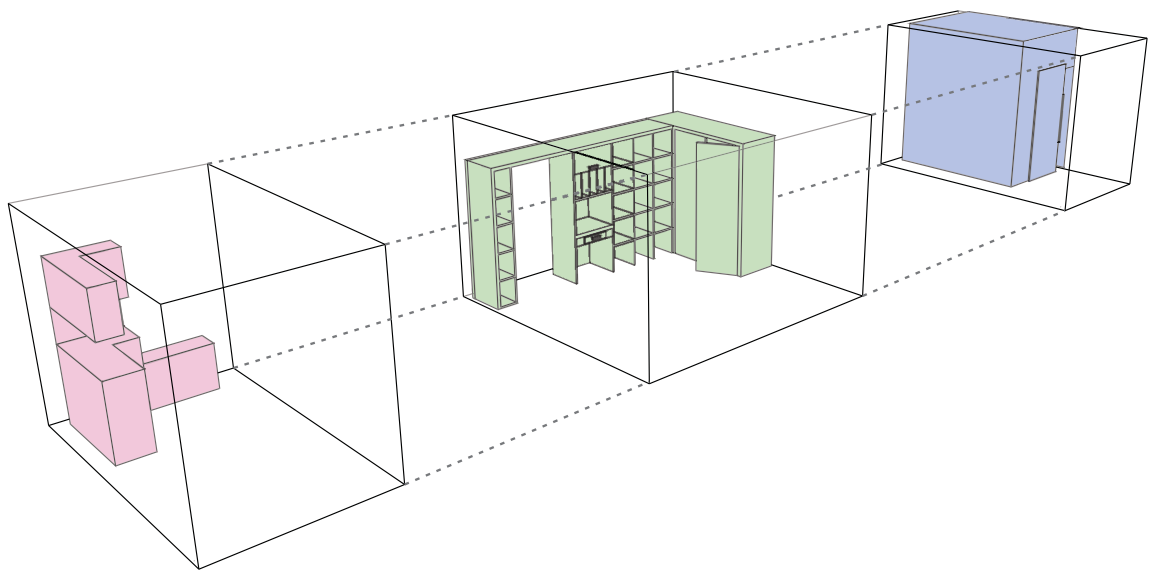


Figure 22: Nursing, Rest/Work, and Bathing pieces available to support aging user.

When the limitations of health deem it necessary for a greater level of care the rural senior may relocate their residential pod to the collective housing armature that will support the resident both physically and socially. The pods will be moved by truck to the facility or to the community where they are needed.



Figure 23. Concept collage detailing mobile pods arriving to central facility in community.

When the pods are no longer required in the armature, they are able to be moved to a new resident or if not needed, disassembled and stored in a central location between communities. However, with ever increasing numbers of aging rural residents, demand around the province for spaces and beds for care and assistance will continue to increase as well, minimizing needs for pod storage and promoting the continuation of the cycle as seen in *Figure 24*.

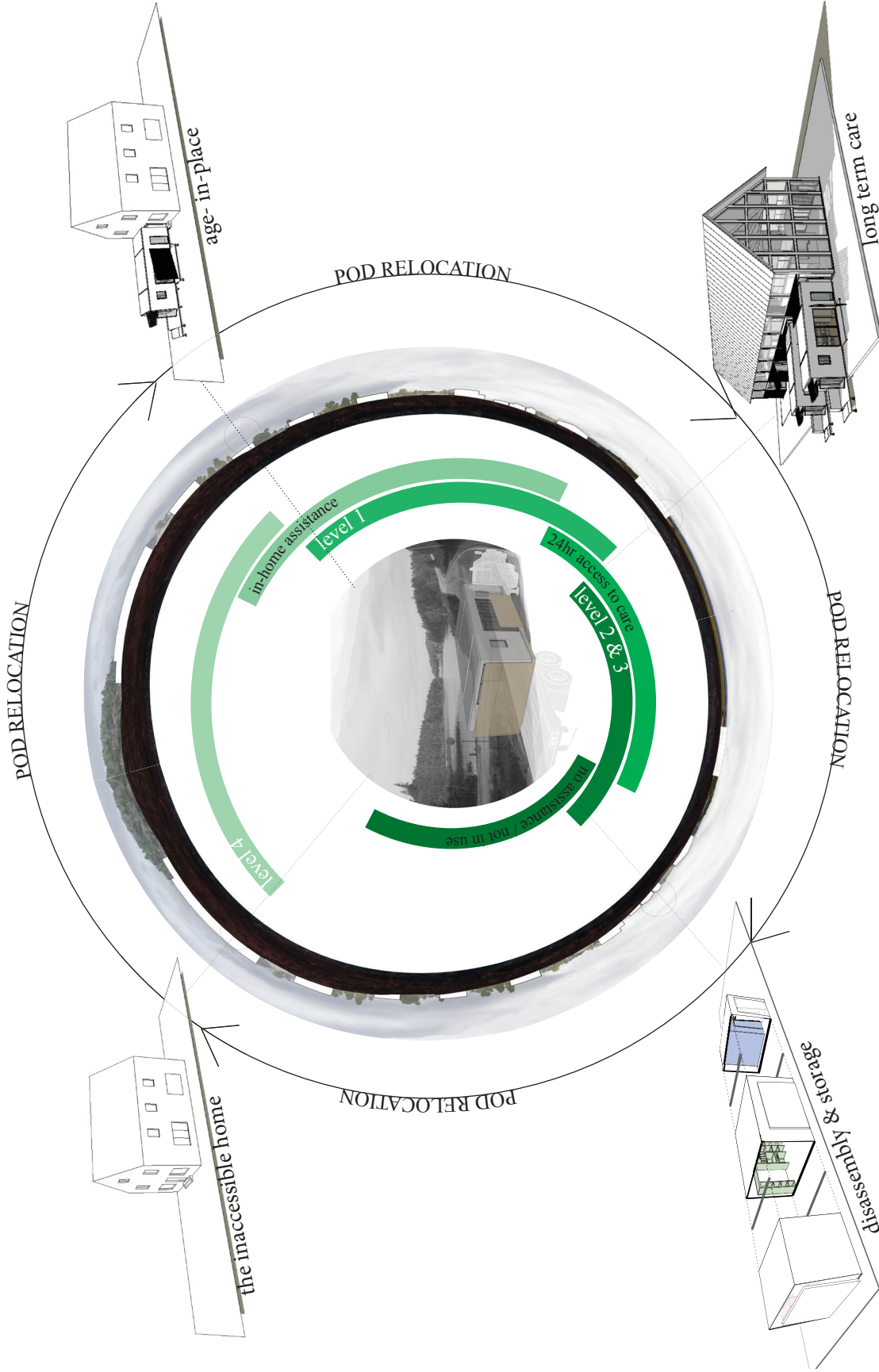


Figure 24: Concept diagram depicting life cycle of the pods and level of care associated with each pod placement

## Mobility Implications on Size

The Nova Scotia Motor Vehicles act provides strict dimensions to allow for safe transport of goods. (Motor Vehicle Act 2010) The design of the modular units considers these dimensions so that efficient transportation in both time and cost is possible. The dimensions are such that a written permit for transportation of the pods will be necessary but no intervention beyond that is needed allowing for transportation to be completed easily with minimal interruption. In *Figure 25* we can see the modular unit loaded onto the transport truck.

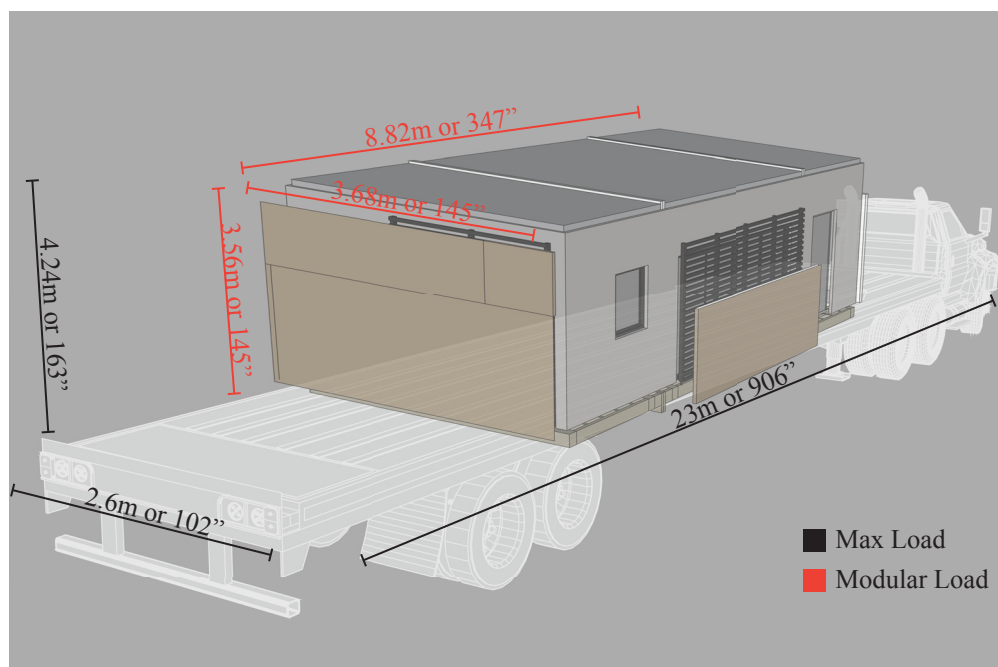


Figure 25. Diagram depicting modular unit transportation. (Motor Vehicle Act 2010)

## Phase 1: Adapting to Aging in Place

“The ultimate possibilities of a completely adaptable dwelling are limitless. A flexible house should be one that effervesces with the opportunities it offers to its inhabitants – the option to have peace and seclusion while living in the city centre, or to be connected to friends and business colleagues while living in a remote place” (Kronenburg 2012).

## **Architecture Evoking the Changing Senses of the Aging Individual**

“Every touching experience of architecture is multi-sensory; qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle. Architecture strengthens the existential experience, one’s sense of being in the world, and this is essentially a strengthened experience of self” (Pallasmaa 2005, 45). In Juhani Pallasmaa’s *The Eyes of the Skin*, Pallasmaa describes how architecture is responded to by multiple senses and how it is the role of the architect to consider that the physical and mental bodies of the user groups are not constants. Architecture must respond to more senses than just the visual. As Pallasmaa explains, it is architecture that guides our thoughts and experiences of a space. Our minds can imagine our place in relation to the outdoors, but it is the built surroundings that allows us to think clearly. As an individual ages, their dwelling or space in a way ages with them, each influencing the body of the other, how they move, are decorated. “To at least some extent every place can be remembered, partly because it is unique, but partly because it has affected our bodies and generated enough associations to hold it in our personal worlds” (Pallasmaa 2005, 44).

## **Introduction of Characters to Foster Design**

Developing a unique piece of architecture for each senior is a critical part of this thesis. Though the pieces may adapt to different environments and sites, they must also adapt to the individual needs of the inhabitants, to creating individual environments.

To better understand the unique life course of the aging rural senior, a set of characters was created. Taking from personal experience, study, and conversation, three main story lines were constructed examining different paths along which the senior and the architecture could interact.



#### MADGE - 72 f.

Originally from rural community, Madge has a passion for the outdoors and gardening. Her eldest daughter Angela, worries and wants some care available to her mother, as well as a more accessible environment for safety.



#### CLIFFORD - 81 m.

A widower from the edges of the community, Clifford has been living in the same house he grew up in, watching his fields and puttering in his shops. Clifford has Diabetes resulting in increasingly limited mobility and the need for weekly monitoring.



#### JANET - 74 f.

Diagnosed with Alzheimer's 2 years ago, Janet's disease is advancing rapidly. Both unmarried teachers, Janet has lived with her sister Jacqueline all her life. They rely on one another. Her sister wants to create an environment with familiarity.



#### JACQUELINE - 73 f.

The sister of Janet, Jacqueline has been with her sister forever, and as her sister's illness has progressed the strain on her has begun to effect her own health leading her to look out for more help. It is of vital importance to Jacqueline that she remains a key person in her sisters care.



Figure 26. Character Diagram introducing perspective users. Please note that these are fictional examples

In the case study of Madge, a recent stroke left her with some permanent challenges. Her eldest daughter Angela, worries and wants some care available to her mother, as well as a more accessible environment for safety. At high risk for another stroke, Madge's assistance may increase but for now she wants to remain near her gardens. With this in mind the mobile modular unit comes and attaches to Madge's home, providing accessible rest, bathing, and care as seen in *Figure 27*. The new attachment also assists in bringing Madge's gardens nearer to her so she may remain active as she ages at home.

In the case study of Clifford, his need for assistance managing his disability is increasing, he is eager for nursing at home help as well as a more accessible space to continue his passion of working with his hands. As seen in *Figure 28*, Clifford using the large section of the modular unit as a workshop to continue his wood carving.





Figure 27. Experiential drawing depicting a modular mobile unit affixed to a home to allow for aging in place. In the case of Madge it allows her to garden with some ease as there are raised beds and deck space now connected to her living.





Figure 28. Experiential drawing depicting a modular mobile unit affixed to a home to allow for aging in place. In the case of Clifford it allows him to have an accessible space for working and care assistance in his home.

## **Designing for the Aging Body**

To create pieces of architecture capable of adapting to the aging users needs, they must first be usable by the aging person. When planning and designing for the aging population the existing requirements of the residents as well as the future needs should be considered. Consequently the design will promote aging-in-place as the environment will be able to support the changes of their bodies and their environmental competence. In a study of five European samples, it was found that seniors living in accessible housing perceive their home as a more meaningful and useful space. Being able to be in control of their own space, the participants are more independent in daily activities and have a better sense of well-being. (Oswald 2007) As the home becomes more accessible, the aging user is able to perform more tasks within their own environment and remain active.

The chronic health needs of the aging senior can result in barriers to autonomy, chronic pain and fatigue, loss of stamina, and impaired mobility. Sensory impairments (e.g., vision, hearing), serious acute illnesses (e.g., cancer, stroke), and cognitive changes (e.g., Delirium, Alzheimer's) result in a decline in functional activity and greater attention is needed for patient safety. The built environment needs to support a wide and variable range of functional needs in the very heterogeneous population of older people, (Parke 2007) To better understand how architectural principles could be used to respond to the specific challenges experienced by the aging body, the information in *Table 1* was extrapolated from a literature review looking at sources from fields of Gerontology, Occupational Therapy, Nursing, etc.. Through understanding the functional limitations of the aging body and providing design details to support the user in these limitations the potential outcomes for the users of the spaces can be met.

<b>Gerontological Principle</b>	<b>Examples of Specific Functional Limitations</b>	<b>Evidence-based Physical Design Elements that Maximize Function</b>	<b>Potential Outcome</b>
<p>Seniors require and environment that fosters accessibility and mobility, providing the users with a sense of:</p> <ul style="list-style-type: none"> <li>• Autonomy</li> <li>• Independence in daily activities</li> <li>• Problem solving</li> <li>• Environmental control</li> </ul>	<p>Physical limitations which develop with many of the most common health issues related to aging such as arthritis and rheumatism:</p> <ul style="list-style-type: none"> <li>• Grasp small objects (e.g. round handles)</li> <li>• Reach above ones head</li> <li>• Lift or carry 10 lbs</li> <li>• Stoop, bend, kneel</li> <li>• Stand or sit for +2 hrs</li> <li>• Climb stairs</li> <li>• Push heavy objects</li> <li>• Sensory impairments (e.g. vision and hearing)</li> </ul>	<p>Specific considerations to the built environment provides:</p> <ul style="list-style-type: none"> <li>• Equipment to compensate for disabilities and self-care</li> <li>• Space to move independently (e.g. 32” min. door openings)</li> <li>• Lever-type handles</li> <li>• Colour that emphasizes what is important and de-emphasizes what is not.</li> <li>• Mechanisms to control the impact of outside environment on interior spaces</li> </ul>	<p>Seniors and potential older visitors:</p> <ul style="list-style-type: none"> <li>• Require less assistance in their private spaces</li> <li>• Have confidence to express needs</li> <li>• Experience less anxiety</li> <li>• Diminished de-conditioning</li> <li>• Improved sleep</li> </ul>
<p>Seniors require and environment that promotes harm reduction by:</p> <ul style="list-style-type: none"> <li>• Facilitating safe mobility</li> <li>• Reducing anxiety</li> <li>• Enabling restful sleep</li> <li>• Supporting physical and cognitive activity</li> </ul>	<p>Physical limitations which develop with many of the most common health issues related to aging such as arthritis and rheumatism:</p> <ul style="list-style-type: none"> <li>• Supporting oneself</li> <li>• Balance</li> <li>• Manipulating controls</li> <li>• Stoop, bend, kneel</li> <li>• Stand or sit for +2 hrs</li> <li>• Push heavy objects</li> <li>• Sensory impairments (e.g. vision and hearing)</li> </ul>	<p>Specific considerations to the built environment provides:</p> <ul style="list-style-type: none"> <li>• Adequate storage to reduce clutter in areas of traffic</li> <li>• Floor finishes with smooth transitions to avoid tripping</li> <li>• Bathrooms and active spaces designed to aid access and independent self-care</li> <li>• Stairways, handrails and flooring prepared to accommodate mobility needs (e.g., constructed to clearly delineate surfaces and accommodate vision and physical strength changes)</li> <li>• Consistent light, minimal glare, natural light</li> </ul>	<p>Seniors and potential older visitors:</p> <ul style="list-style-type: none"> <li>• Increased opportunity to remain in an age-in-place environment</li> <li>• Increased independent activities of daily living</li> <li>• Diminished de-conditioning</li> <li>• Decreased risk of falling or strain</li> </ul>

Table 1: Composition of Gerontological principles, common physical limitations of aging, and the designed principles found through various studies to provide positive outcomes for users as they age. (Andes 2004, Cooper 1992, Niva & Skar 2006, Parke 2007, Regnier 2002)

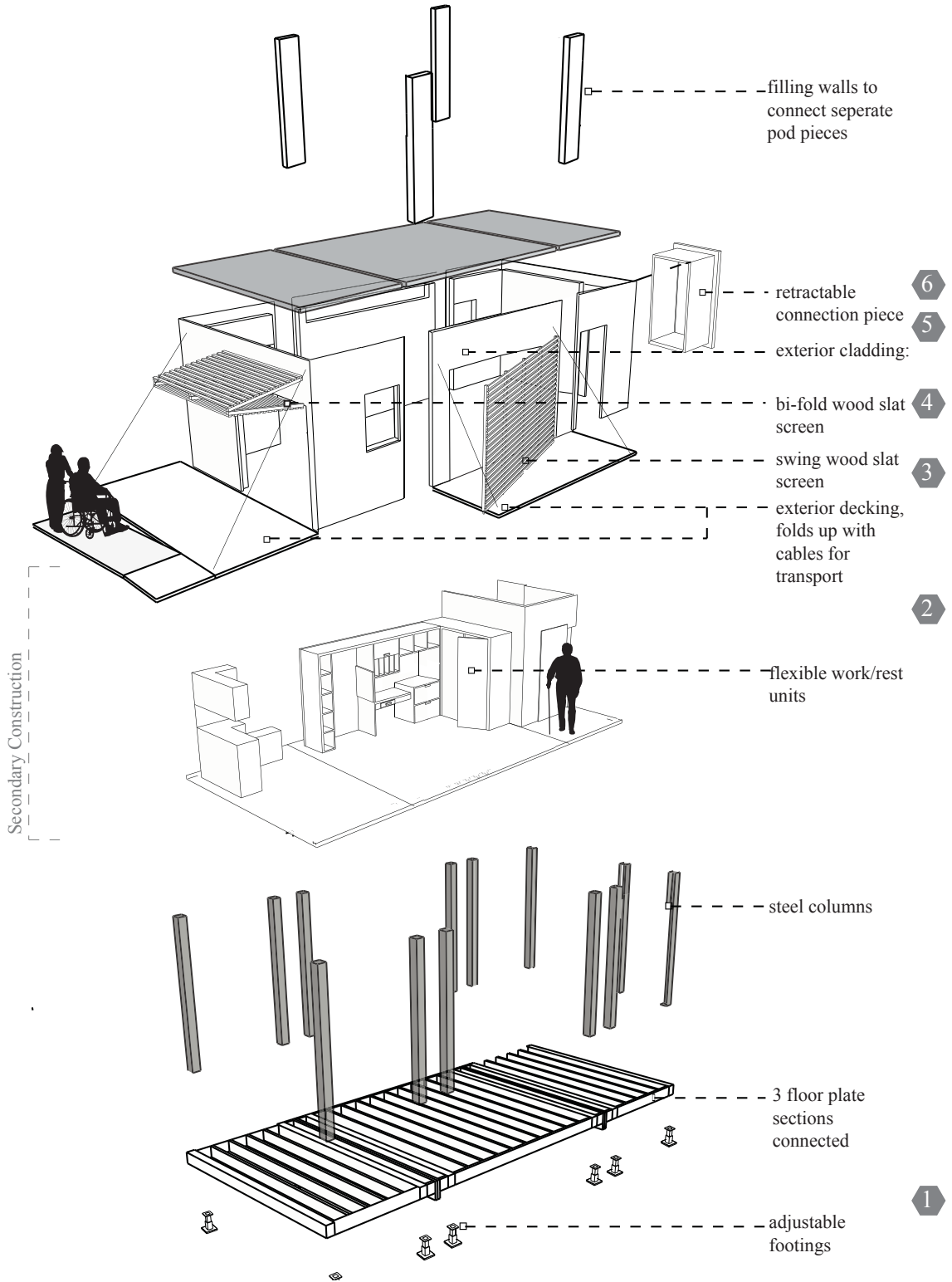


Figure 29. Exploded axonometric depicting the sequence of the primary construction of the pod pieces, the secondary construction of the interior programmatic elements, and the areas to be detailed more in depth.

## Details

### Adjustable Footing 1

- The intent of the footings is to make minimal impact on the property where they pod rests and to be easily placed and transported leaving little evidence.

### Functional Storage and Workspace 2

- Creating a modular storage workspace allows features which can be adjusted to fit the specific needs of the user and accommodate multiple programs such as bedroom, workshop, office, etc..
- By using a system of shelves and drawers installed at varying heights and places, the workspace or living space can be adjusted to best fit the users specific needs.
- Inspiration was taken from peg boards used in standard workshops. A large scale version is installed in one of the three sections of the workspace. This allows for pegs to be removed and added to hang various items or to support shelves or a table top. Also mobility assist devices can interact and move closely without interference.
- Pull out shelves/drawers can greatly reduce the strain of bending over to reach the back of cabinets. Pull down shelves in the upper cabinet can reduce the amount of reaching. The open (D-shape) pulls are able to be manipulated by users of varying grip strength. (Niva & Skar 2006)
- Moments for personalization are key to the design. Open shelves and hanging places for personal items allow these mementos and memories to remain in view.

### Mechanisms to Control Outside Environment 3 4

- Access to exterior spaces is provided by sections of glass doors and windows, merging inside and outside providing access to those with limited mobility. Glass allows significant natural daylight, which research has shown to stimulate the circadian and

- neuroendocrine systems keeping the body in balance. (Brawley 2003)
- Filtering the amount of light that comes in can be important for seniors suffering from illnesses that experience “sun-downing”, agitation brought on by the setting of the sun. (Parke, 2007) Limiting the amount of glare and jarring changes in light is important to senior health, therefore finding a balance between incorporating natural light and keeping the light constant is needed. This is met by using surfaces that minimize glare such as wood floors and walls with low gloss and fritted glass in full length windows, reducing the amount of light entering the space while maintaining visual connection with outside. (Brawley 2003)

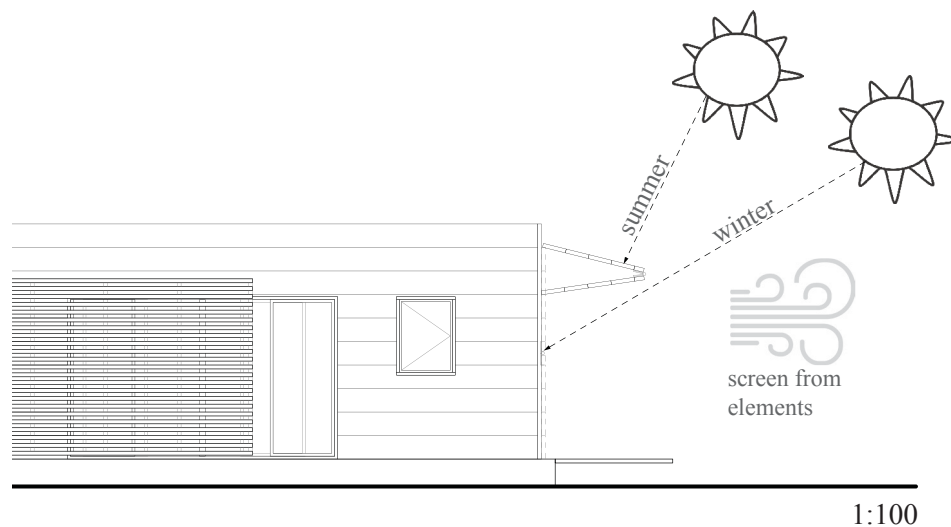


Figure 30. Diagram depicting the environmental factors that impact the pods and the wood slat screens.

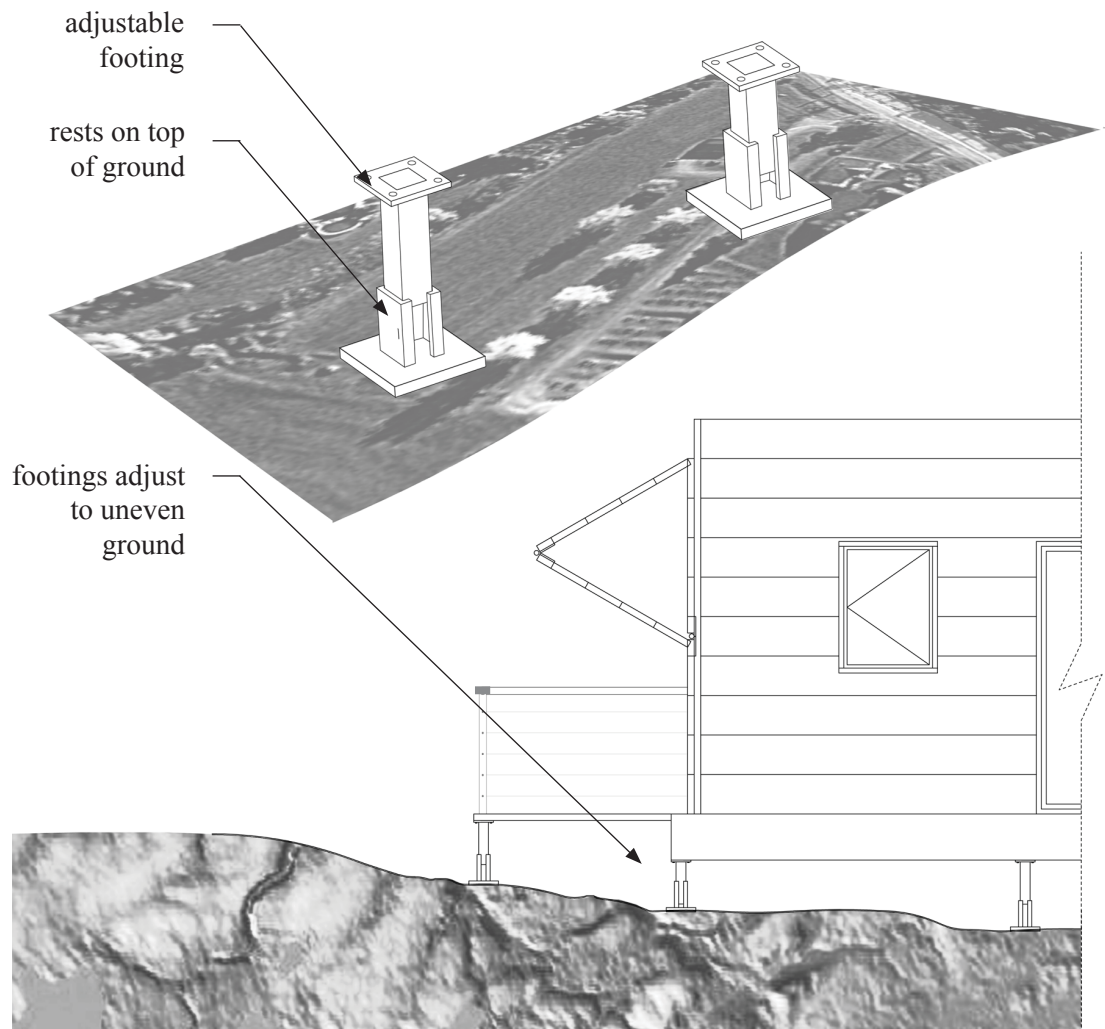
- As shown in *Figure 30*, when raised the wood slat walls act as an awning allowing sun to enter the space in the winter providing warmth when needed, and to provide cool shade in the summer. When the slatted wall is down it can act as a screen from the elements, dampening the harsh noises on the glass surfaces from the elements that disrupt users with auditory sensitivities such as hearing aids. (Brawley, 2003)
- In order to maintain autonomy of the user as well as their safety, the doors are controlled by mechanisms assisted by the user, After examination of manual door opening and the physical limitations associated with an aging user, using solely manual force to operate the external wood slat doors is not a feasible option. (ADA 2015)

- By using a hydraulic mechanism to open the doors, the major force required for the operation is not reliant on the varying strength of the user.
- The operation, the amount of opening exposed, angle of opening, of the mechanism is initiated and controlled via a hand lever, easily grasped and turned by the user. Providing them with a sense of independence. (ADA 2015, Niva & Skar 2006)
- The exterior decks create outdoor rooms for the user, bringing access to the outdoor environments easy and accessible, providing opportunity for outdoor activity.
- Guardrails are affixed to deck for safety, dark colours are used to distinguished from surroundings. (Brawley, 2003) Taking material cues from the modular structure, steel posts and wood slats are used for the posts and railings respectively.

#### Connection

- A retractable connection piece with an opening width of 34”(The National is used to connect the pod to an existing door frame of either a house or armature building.
- The original frame of the house is removed and the frame of the connection piece is installed.
- The end connected to the pod retracts inside for transport and extends out to meet the building, allowing it to reach around obstacles.
- The side panels are inset windows to emphasize a bright transition between the new and old structures, avoiding the closing feeling of walking through a small corridor.

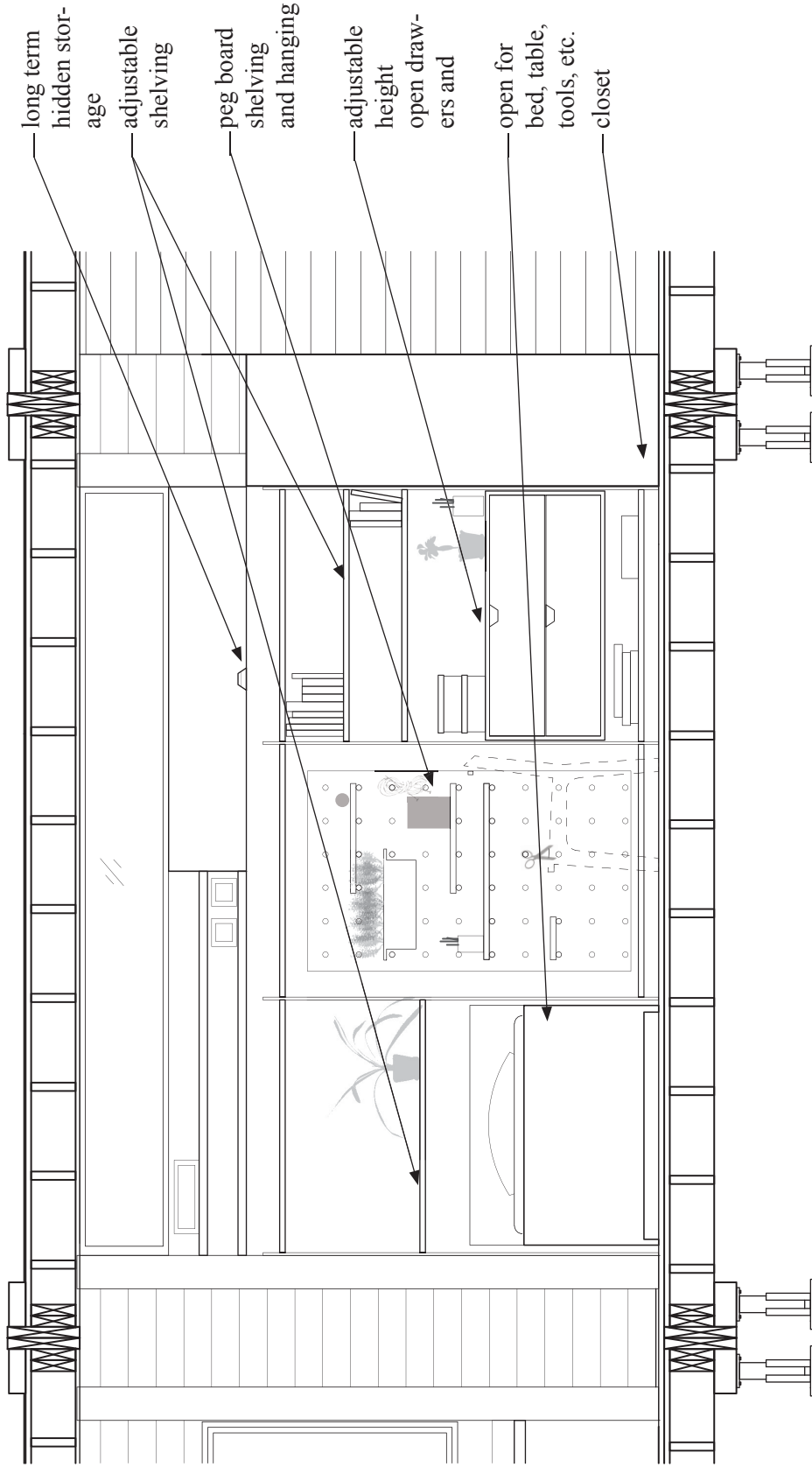




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Figure 31. Diagrams depicting adjustable footings, able to be raised to lowered to allow the pods to reach the appropriate height while remaining level. (Google Earth 2015)

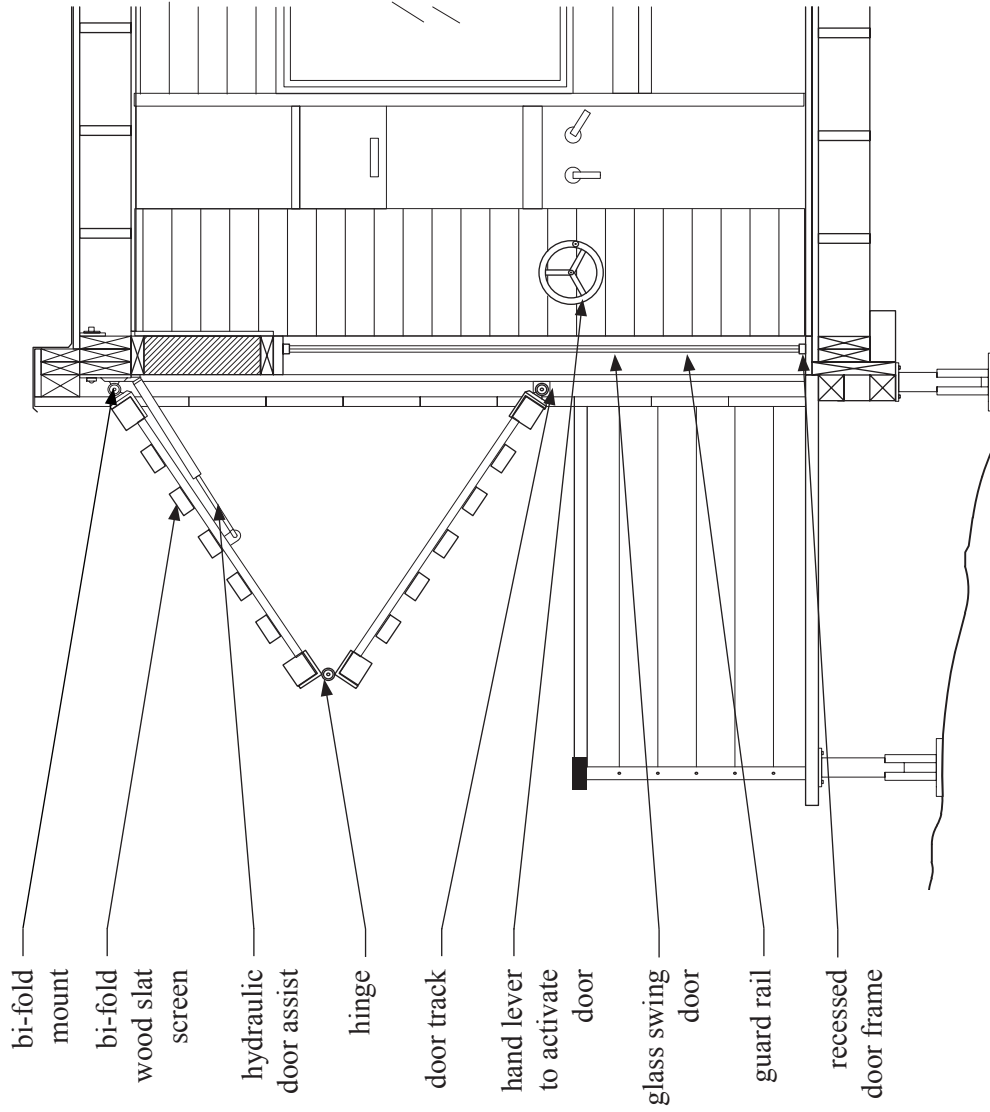




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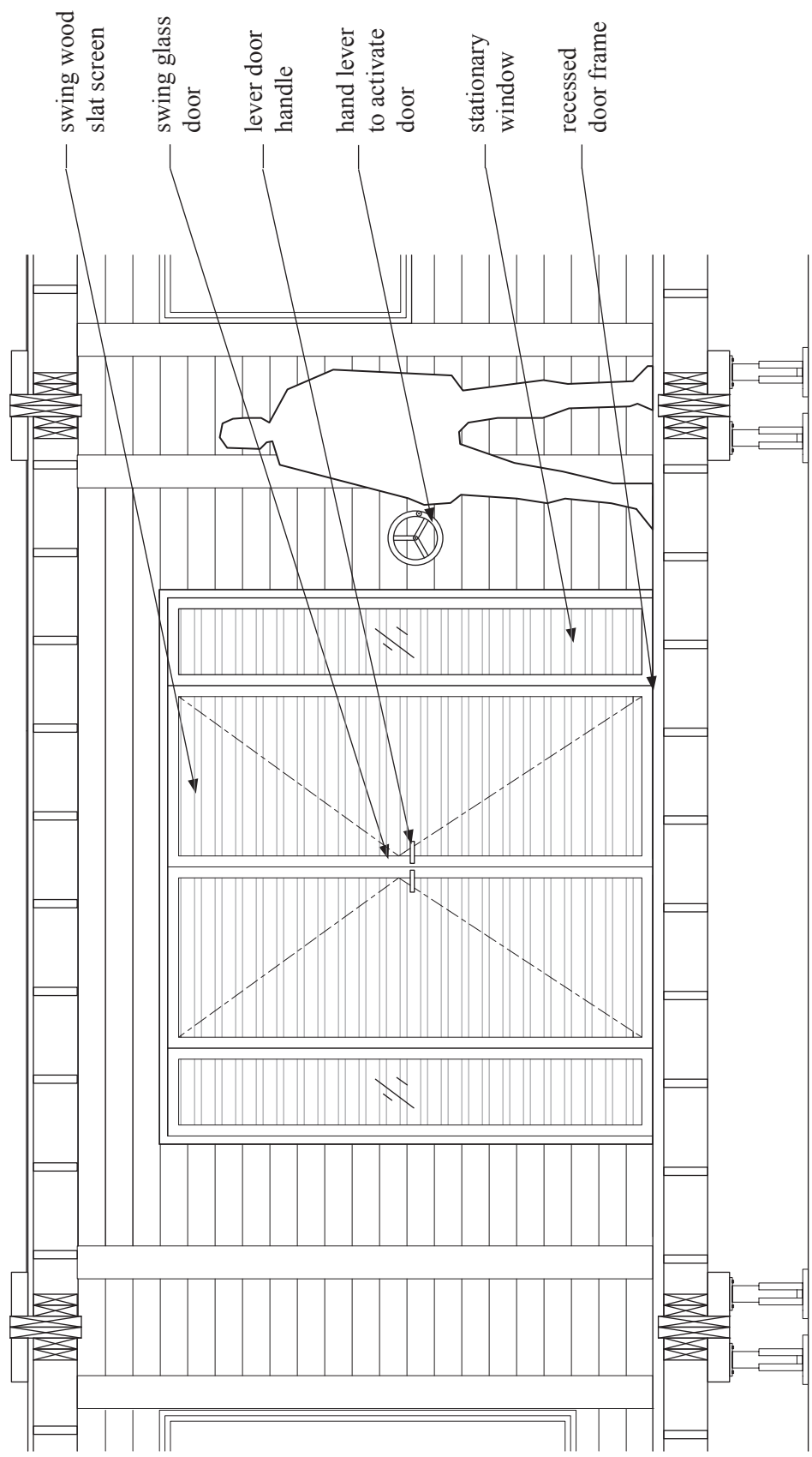
Figure 32. Partial interior elevation depicting flexibility of the workshop/rest areas built ins.



1:30



Figure 33. Partial section depicting the placement and function of the bi-fold wood slat screen, and the connection between the exterior deck space and the interior space.



1:30



Figure 34. Partial interior elevation depicting a closed swing wood slat screen and the glass swing doors.

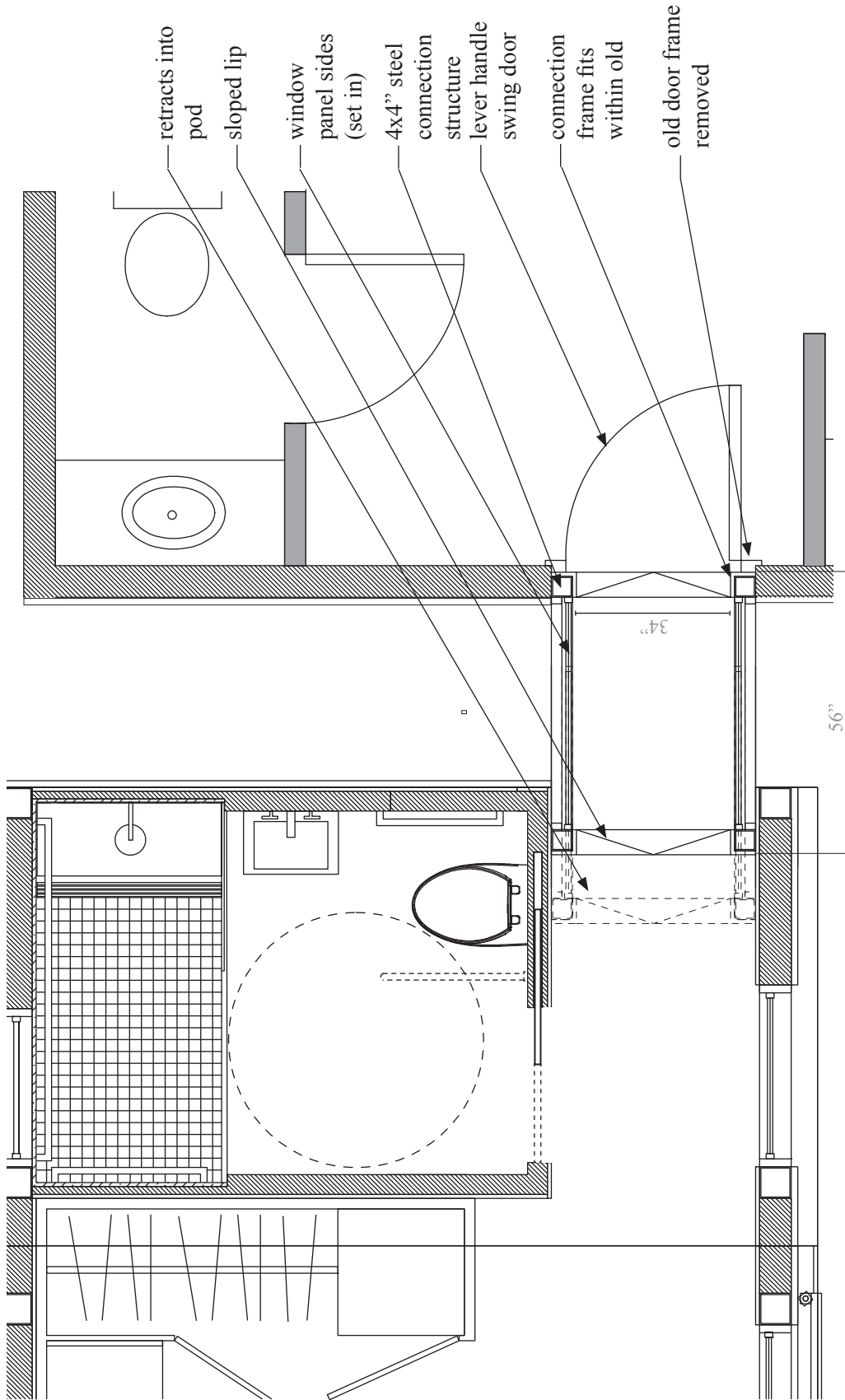
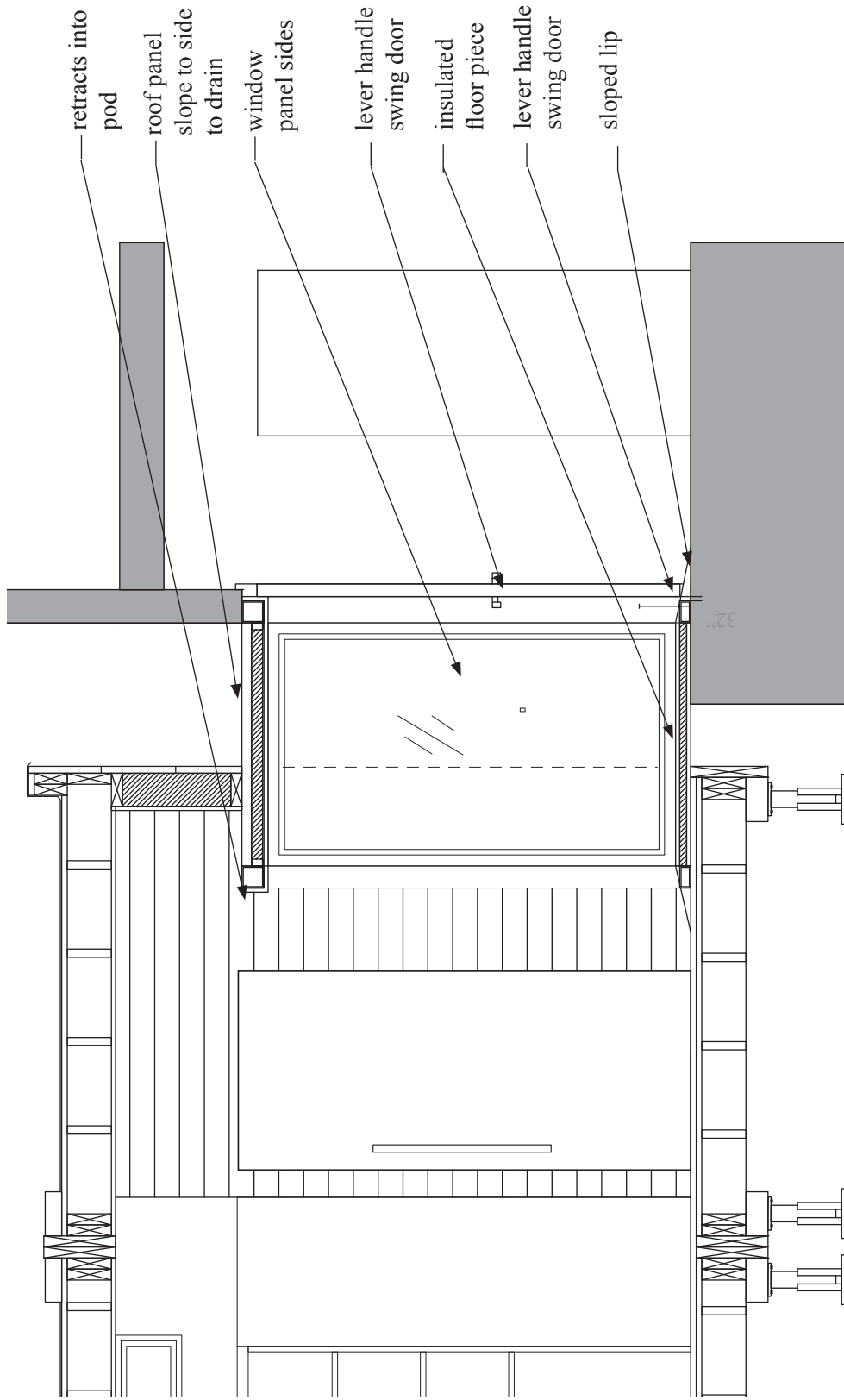


Figure 35. Partial plan depicting connection piece of pod into house/armature. The width of hallway created is such that it remains accessible. The length allows the pod to have room to maneuver near the original structure.



1:30



Figure 36. Partial interior section depicting connection piece of pod to house/armature, fitting in place of original door frame for minimal disruption to original structure.

## Phase 2: Siting and Moving to an Aging Armature

When a life event occurs and a move to a collective housing alternative is deemed necessary the siting of the facility for the individual moving is crucial. In siting this armature a methodology that will allow one to examine a rural community and implement a model of development for a seniors community architecture is the intent. The resulting architecture is one which integrates the new seniors community with the existing place as a whole and advances the development with the aide of the elderly. This methodology will involve examine the specific community through the lens of :

- The **heterogeneity of the community**, and the current aged and ageing community members.
- **Conscious Zoning**, examining the community, its boundaries, topography, services and landmarks to define areas within the community in which opportunities for community interaction and productive development can best occur. A key element of this is examining areas where opportunity for engagement is not just with the aged interacting with the rest of the community, but also where the rest of the community will want to interact with the new aged community architecture.
- **Time**, time has many facets that bring different elements of aging into focus. Considering biological time, which helps to understand how the physical processes of aging influence lifestyles, community participation and social networks of adults as they age. (Waldron 2014) Considering natural time, to develop an understanding of environmental patterns that shape rhythms of life. Latitude, seasonality, and patterns of daylight and darkness are elements of these rhythms. Physical environments shape both long-term and immediate experiences and rhythms. (Keating 2008)
- The **identity of the rural community and the rural community residents**. Considering how the community has developed over time, what industries and experiences make up the roots of the community, and how can they/should they be preserved through modernization of the program.



Figure 37 & 38. Consideration for the extremities of the site. The areas in the maximum range of the user and the moment for connection to the greater community. The downtown core providing services and events on one side, and the dykes and trails providing recreational opportunities on the other.

### **Key Drawings - Armature**

The armature piece is proposed to be such that it could be new construction as shown in this case, or a re-furbished space within the community where spaces exist for modules to affix to. The intent is to create an open concept care facility, where the modules plug into a central unit where the staff can monitor and care and provide services and support. This central space can have a specific secondary program, or in the case proposed in this thesis, ample open space to be used by the residents and visitors for various communal activities.

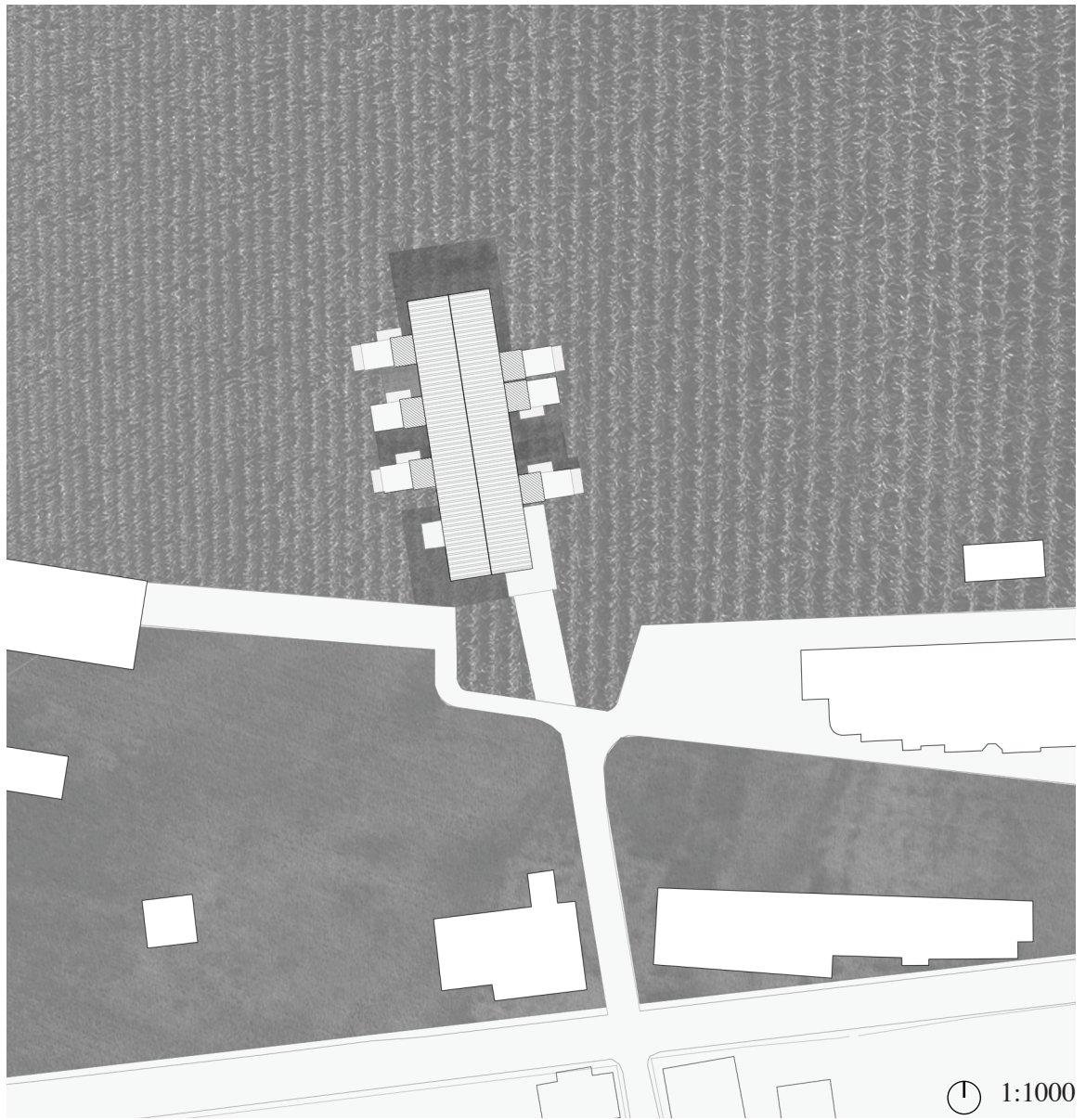


Figure 39. Roof plan of armature component with affixed pods.



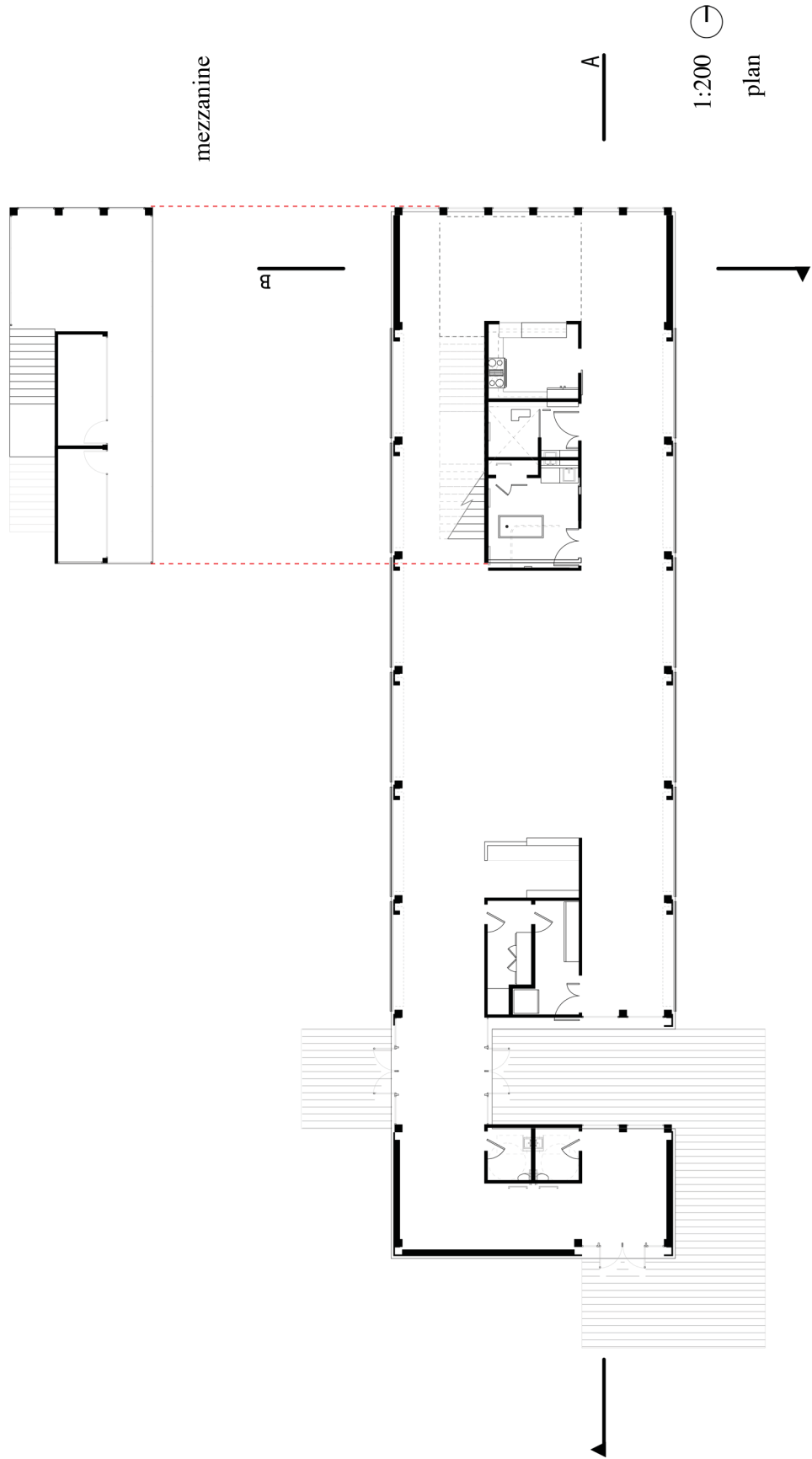


Figure 40: Floor plan and mezzanine plan of a proposed armature building. Open concept with interior blocks for support program and monitoring. Maximize perimeter for spaces to connect mobile modular units.

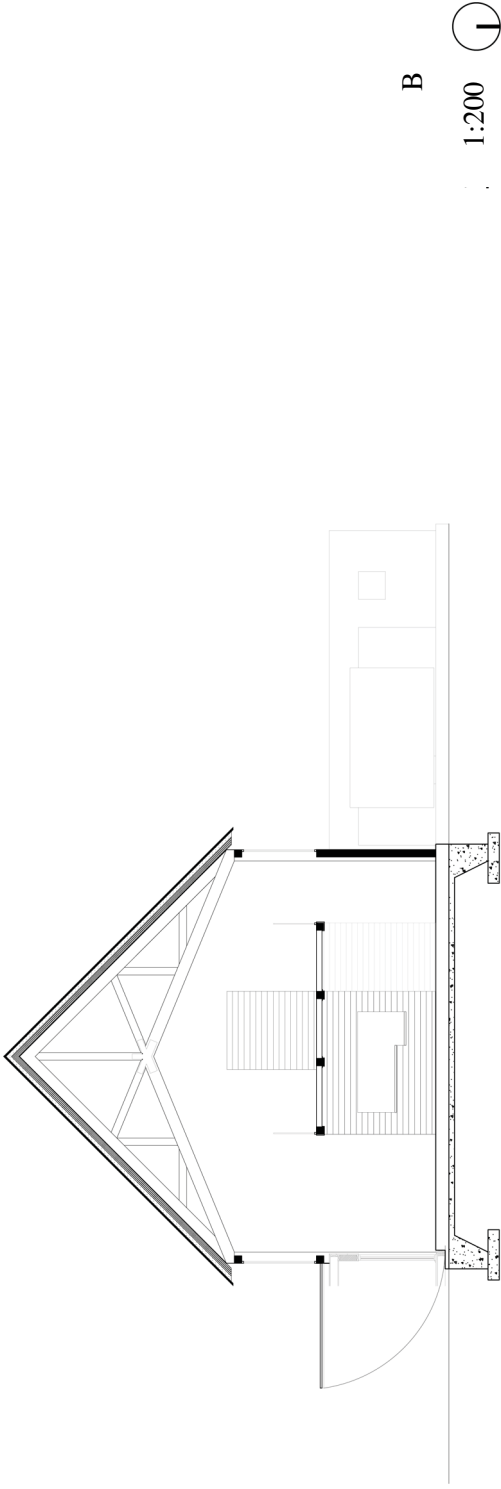


Figure 41: Cross section of a proposed armature building. Mezzanine balcony provides office and monitor platform for staff. Slatted second facade swings up to allow mobile modular unit to connect.

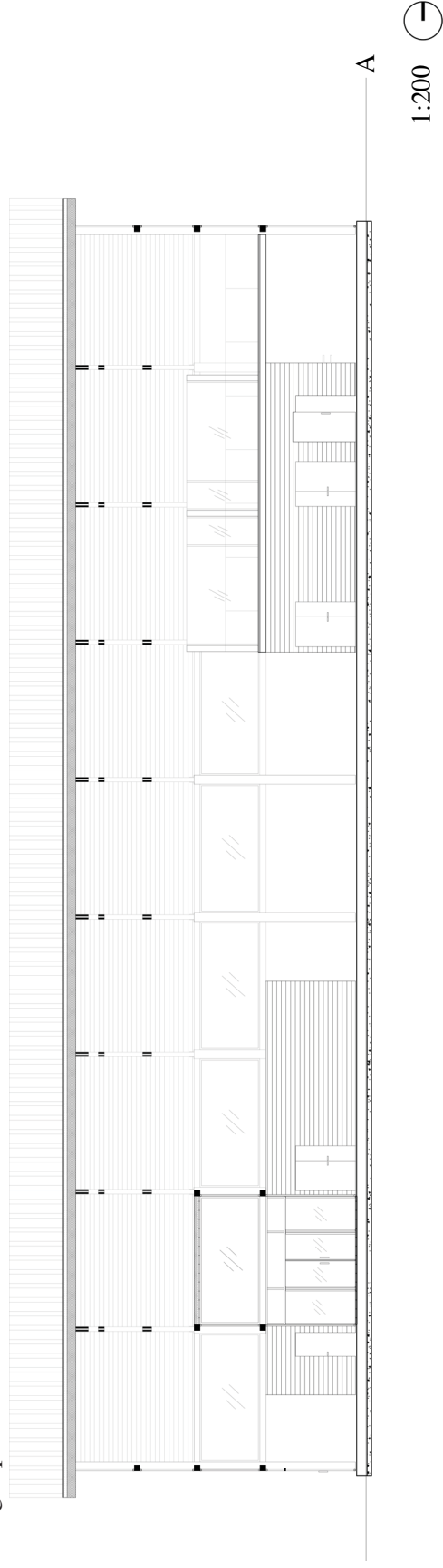


Figure 42: Longitudinal section of a proposed armature building. Main entrance within building connecting the private lives of the residents with the visitors of the community.



Figure 43. Experiential drawing depicting a modular mobile units attached to the armature. The facility is cradled by both the arable land that makes up much of the community identity as well as the downtown of the community itself.

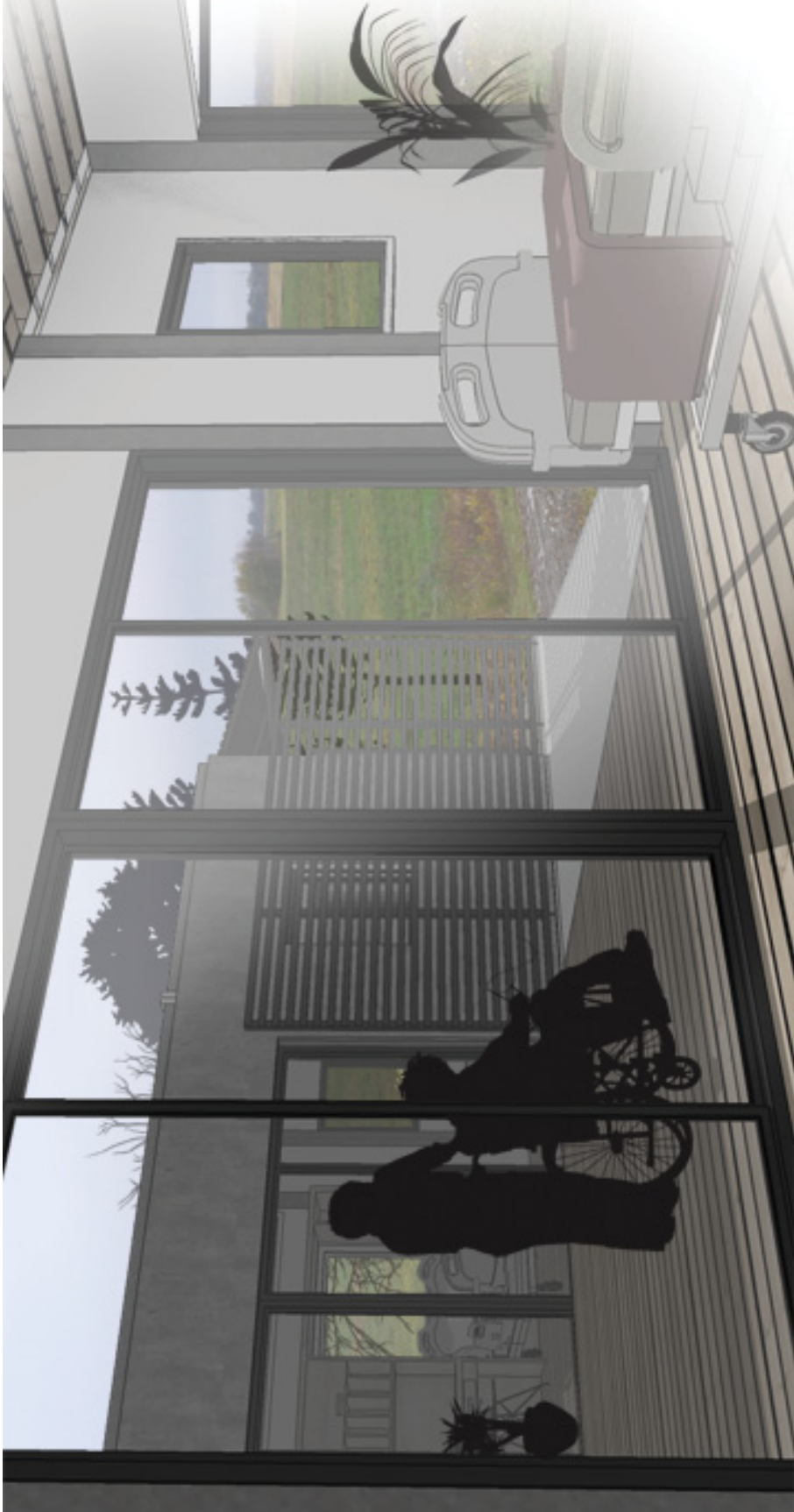


Figure 44. Experiential drawing depicting two modular mobile units attached to the armature and shared between residents whom are close, In the case of Janet and Jacquelin, two sisters requiring continuous care, it allows private but shared spaces for the pair to watch over one another.

## **Pilot Project Proposal - Business Model**

Currently in the province two main living arrangements for aging seniors are the Intuition based model driven by scale and economic feasibility and aging at home with minimal care and resources available. The intent for this project is to examine if there are opportunities for a model somewhere in the middle, one that provides opportunities for living in the home as well as the benefits of services and care of the larger models. To consider a new model such as the mobile modular one proposed in this thesis I wanted to examine the current model for getting a new facility built in the province. And with this propose an alternative model to this that allows this mobile proposal to be feasible.

The current model of procurement for long term care beds is undergoing review by the Provincial Government, the primary source of funding for nursing home operational costs. (Duff 2015) This review would provide opportunities for the consideration of new model types and the introduction of a pilot project introducing this mobile modular approach to seniors housing. By introducing the model proposed in this thesis as a pilot project, the possibility of acquiring funding and support increases as it first becomes a study with the opportunity for expansion and further development, as opposed to attempting to initiate massive province wide overhauls initially.

### **Adaptation of the Current Model**

In a pilot project such as this The Department of Health and Wellness would be considered the client. The project would begin by consulting Transportation and Infrastructure Renewal and implementing a plan to consider new models of ownership, financing, and construction methodology such as this modular model.

The modular concept could be submitted to DHW(the client) and TIR(the contracting agent) as an unsolicited proposal. Ideally the proposal would be submitted by a partnership/consortium prepared to work collaboratively with the Government on the pilot project to test the concept. This consortium could be one, or a combination of, an operator and a developer, land owner, health care professionals, food company, service provider, etc.. The consortium, in exchange for a license to operate and an allocation of long term care beds, would offer to underwrite the entire cost and hold all risk associated with the design, finance, build and management and operation of the project. (Duff 2015)

In order to be feasible the business model would need to draw revenues from multiple sources including:

- government per diem for LTC beds - the standard amount calculated by the government given to the facility to run and support each resident in each bed. This source of revenue is the primary source and would be the largest guaranteed source of revenue.
- private care services on a fee for service basis - personal care, additional services beyond what is required based on the level of care one is assessed at.
- in-home support services - cooking, cleaning, yardwork, etc.
- community based care services - transit, excursions, etc.
- potentially co-located retail services that fit the community model - pharmacy services, market services, other services fitting to the identity of the community in which it is located.

The expenditure model would be driven by staffing ratios and care service requirements for each of the lines of business. (Duff 2015)

### **Proposal Specific Adaptation**

Through further consultation with developers or current nursing homes throughout the province, a unique aspect of a mobile proposal such as this was considered. The need for

the development of a new policy model specific to the proposal which would guide how seniors enter the continuum of care and progress through the levels of care. Through collaboration with both DHW and Nova Scotia Health Authority. Examples of issues include how means testing would need to be applied at different stages, how couples progress together even when care requirements differ. This policy model would require collaboration with both DHW and Nova Scotia Health Authority.

Examples of issues include how the pilot project will be applied at different stages, how couples progress together even when care requirements differ. This policy model would require collaboration with both DHW and Nova Scotia Health Authority. One of the major changes this proposal creates in the business model would be the ability to age in the home longer and remain out of the larger facilities which may have more services but also larger per diem costs. With fewer people in LTC beds, the staffing costs would hopefully decrease, the intent is that this offsets the initial production of the pods and the increase in in-home support services required.

With community architecture there is an *if you build it will they come?* attitude that any consortium would consider before agreeing to take on the responsibility of a project such as this. With seniors housing in this province, there is not the demand in the private sector, particularly in rural communities, for private senior facilities. Realistically, any proposal must consider that the primary source of support in running the facility needs to come from the government and the per diem income afforded.



### **CHAPTER 3: CONCLUSION**

“Rural places are both idyllic and difficult just as older rural adults are both resilient and fragile” (Keating 2008).

Through drawing attention to the identity of the rural senior and their community, this thesis examines issues and barriers the rural senior faces in regards to aging in place and access to long term care. Through the proposed mobile modular architecture the unique needs of each senior is considered and adapted to. The architecture counteracts the involuntary living in motion that occurs with seniors in rural communities, forced to leave their homes, communities and social networks, by the aging process and its implications on health and lifestyle.

There is no correct answer for housing the aging population, but addressing the heterogeneity of the aging population and their unique requirements is progress. Examining new solutions that move away from the institutional model of aging found in traditional nursing homes and focusing on solutions that foster independence as well as provide support.

The architecture of the designed spaced to house the aging population is vital, as is the siting of any facilities or collections of seniors proposed. At both the personal scale and the community scale it is important that activity of the senior is promoted, that they live in spaces conducive to programs and people to which they can engage. Through conscious design of the living spaces and their surroundings the senior is able to retain a sense of autonomy and is able to take control of how they age.

With ever rising numbers of aging persons in our community, the voice of the senior will be louder then ever. Current care models will continue to be scrutinized and the demands and expectations of the users, both resident and staff, will have an increasing impact on



\innovation in design, technology, and the architectural discourse.

## APPENDIX A - NOVA SCOTIA NURSING HOME EXAMINATION

The Nova Scotia Department of Health institutes various categories of care for the provinces seniors, levels of service, as well as minimum space requirements. (Department of Health and Wellness 2015) Currently as categorized by the province the levels of care are:

### *Level 1:*

- Residents are ambulatory and highly functioning requiring mostly room, board and / or lodging services.
- Access to care is on an optional service by service basis.

### *Level 2:*

- Residents are relatively independent with some functional or mental impairment; require limited or minimal supervision or assistance with activities of daily living or behaviours of daily living.
- Top level care requires 1.5 to 2.0 hours of personal care per day.

### *Level 3:*

- Residents have more extensive functional or mental impairments; require more extensive assistance with activities of daily living and behaviours of daily living.
- Top level care requires 1.5 to 3.5 hours of nursing and personal care per day.

### *Level 4:*

- Guest / Care Giver Suites.

As determined by the province the space requirements for the province's seniors are as:

- Room = 190sq.ft / resident
- W/C = 55 sq.ft / resident

Therefore the residential floor area =  $(190+55 = 245)$  245sq.ft x # residents

- The space per senior in the building is 930 sq.ft / resident

These large numbers lead to sprawling facilities being constructed presently.

The province of Nova Scotia also institutes guidelines on placement in the various homes and levels of care. The *First Available Bed Provision* has as its guiding principle that the care needs of the clients comes first and the location and placement preferences comes second. (Department of Health and Wellness 2015) Once a client's level of care and therefore priority is assessed, they will be placed on the waiting lists of all facilities that meet their requirements and are within 100 km from their preferred community. If a bed becomes available outside of this radius they may still be directed to take it and put again on a waiting list for a closer facility. Also if the client rejects the bed for non medical reasons, they will be taken off waiting lists for 12 weeks before they can reapply. This leads to many seniors living in communities that are not necessarily their own, away from friends and family.

It should also be noted that many seniors in the province who are not able to return home after a hospital stay, may need to remain in the hospital for extended periods of time until beds in long term care facilities become available

### **The Facility Models Currently Used by the Province of Nova Scotia**

#### *The Institutional Model:*

Older facilities still in use throughout the province operate on an institutional model which originated from the health care system and shares many similarities. These models primarily consider efficiency and maximizing the numbers of residents a priority, resulting in issues of loneliness, helplessness and boredom, three factors which plague these traditional nursing homes. The physical model of the long term care facility shares many characteristics with the health care institutions they originated from. The foot print of the rooms are as small as possible and are usually shared by two if not more people with only curtains to separate the residents. With usually only one window, the outside environment is hidden and a challenge to control.

The institutional model is also of course used in the long term care wings of hospitals, where residents unable to return home after hospital stays remain while they wait for available beds.



Figure 45: A residential room in a typical existing Nursing Home built to previous institutional model standards. A shared space with less than 200 sq.ft shared by both residents. (Nycum + Associates 2013)



Figure 46: The old wing of the RK MacDonald Nursing Home in Antigonish, Nova Scotia. Designed in the institutional model it is still fully occupied. (RK MacDonald Nursing Home 2007)

*The Household Model:*

A newer model of Nursing Home facilities currently being adopted throughout the province, these facilities are designed with multiple small “households” in mind of anywhere from 4-12 residents typically in each. This concept relies on the principle of these “households” or families supporting one another, dining together and sharing communal household spaces. Each household also shares staff, with one caregiver present within each household at all times and at least one caregiver floating between the households and performing other tasks (this floater is typically the RN who is acting as overseer).

After having the opportunity to meet with members of the staff, design team and tour one of these household facilities the advantages and disadvantages of this model appear. With the current requirements for the space allotted to each resident and multiple “households” in each facility, the buildings tend to sprawl and it becomes difficult for the residents, and the staff, to navigate them with ease. Privacy in the new model is created with each resident having their own private room, however the communal spaces are sometimes still isolating and assume that the members of the household want to support and share with one another when in fact their levels of care and physical and mental health may differ so drastically that this is not the case. (MacKenzie 2015)



Figure 47: Site Plan of the Shiretown Nursing Home in Pictou Nova Scotia designed by Nycum + Associates in 2012. A 53 bed facility that uses “households” of 9 residents and is situated off the highway on the edge of the community, the facility houses residents from Pictou as well as many other surrounding communities. (Nycum + Associates 2012)



Figure 48: Shared space in the “households” in Shiretown Pictou. Surrounded by the residents rooms, these shared spaces are where the majority of social, dining, and care occurs. (Nycum + Associates 2012)

*The Eden Alternative Model:*

The definition of an elder by the Eden Alternative Organization is “someone who, by virtue of life experience, is here to teach us how to live.” (Eden Alternative, 2010). With a focus on personal care and needs, the Eden Alternative is an educational organization that focuses on innovative care solutions. It is currently being adopted in countries around the world, including Canada and the US.

This organization was first introduced to me in passing by members of my home community in Antigonish Nova Scotia, as one of the facilities in the town, The RK MacDonald Nursing Home, is registered as an Eden Home. The Eden Alternative organization, founded by Dr. William Thomas, is founded on the basis of de-institutionalizing elderly care. Dr. Thomas’s philosophy focuses on the relationship between mental health of the residents and the environment in which they live. Ten principles are introduced such as:

- “The three plagues of loneliness, helplessness, and boredom account for the bulk of suffering among our Elders.” (Eden Alternative 2010)
- “An Elder-centered community commits to creating a Human Habitat where life revolves around close and continuing contact with plants, animals, and children. It is these relationships that provide the young and old alike with a pathway to a life worth living.” (Eden Alternative 2010)
- “An Elder-centered community honors its Elders by de-emphasizing top-down bureaucratic authority, seeking instead to place the maximum possible decision-making authority into the hands of the Elders or into the hands of those closest to them.” (Eden Alternative 2010)

While the intents and adoption of this model are thoughtful and a great advancement from the institutional model. These principles, in practice, appear to be initiated by the operators through staffing and attitude rather than architecture and planning.





Figure 49: The addition of the RK MacDonald Nursing Home in Antigonish Nova Scotia, an Eden Alternative Home. (RK MacDonald Nursing Home 2007)

These current facility models tend to operate as centralized facilities and are continuing to move towards larger scale buildings with more beds. With the main models types all moving towards this same large scale, the potential to introduce a model that challenges or differs from these models exists.

## APPENDIX B - PRECEDENT REVIEW

Beyond the study of existing facilities in the province, an examination of innovations related to seniors housing was conducted with three projects standing out and providing initial inspiration for this thesis. These projects explore not just how to house seniors but, as in the case of *Fogo Island*, how to engage and revitalize a rural community through design innovation. In the case of *Wild Strawberries*, how services used by the community at large and the seniors can be shared to benefit both if the siting and location is considered. And in the case of *Geropolis*, the importance of the conversation of aging and how we need to start designing and examining our cities and communities to make them usable and accessible for all stages of life. Case studies of these projects were conducted.

CASE STUDY: FOGO ISLAND  
 LOCATION: FOGO ISLAND, NF  
 ARCHITECT: TODD SAUNDERS  
 PROJECT DATE: STUDIOS - 2010-11  
 INN - 2013

DESCRIPTION: INN & STUDIOS BRINGING TOGETHER CONTEMPORARY ARTISTS, DESIGNERS, ARCHITECTS, GEOLOGISTS, ACADEMICS, FISHERMEN, ARTISANS, GROWERS AND CHEFS. REVITALIZING A DYING COMMUNITY

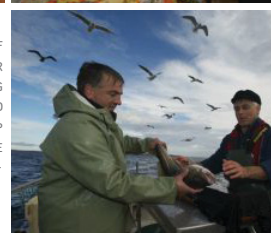


- SITE PLAN**
- 01. Fogo Island Inn
  - 02. Fogo Island Inn Outhouse
  - 03. Parking for Fogo Island Inn Church
  - 04. Church
  - 05. Fisherman's Hall Building
  - 06. Fisherman's Hall Building
  - 07. Graveyard

**PROJECT UNDERSTANDING:** TO SUSTAIN THE COMMUNITY AND ENGAGE ITS MEMBERS BOTH YOUNG AND AGEING BY INVOLVING THEM IN THE NEW ECONOMIC ENDEAVOUR, THE INN, BOTH SEPARATED AND A PART OF THE COMMUNITY, CONNECTS BY BRINGING NEW USERS FROM AROUND THE WORLD TO THE TOWN TO WORK AND LEARN. SITED OUTSIDE THE COMMUNITY SO THEIR IS A SENSE OF DETACHMENT.



**AGEING COMMUNITY:** THE CRAFT AND KNOWLEDGE OF THE COMMUNITY, AND THE TRADITIONS OF OLDER MEMBERS WERE USED WHEN DESIGNING AND BUILDING THE PROJECT. SKILLS OF THE MEMBERS, IN WOOD CRAFTS, QUILTING AND ART, AND FISHING NOW HELP SUSTAIN THE PROJECT AND THE MEMBERS OF THE COMMUNITY TEACH THESE SKILLS TO NEW GENERATIONS AND VISITORS TO THE TOWN.



**TYPOLGY:** AN UNDERSTANDING OF THE EXISTING METHOD OF BUILDING, ROUGH EDGES AND CRAFTED BY HAND. THE NEWFOUNDLAND VERNACULAR OF BUILDING IS REFERENCED IN THE MATERIALS, LINES AND THE STILT WOOD FOUNDATIONS - SHORES- USED BY THE ARCHITECT. PRESERVING HERITAGE BUILDING THROUGH MODERN DESIGN.

Joe Batt's Arm - Fogo Island - Newfoundland - Canada

Wall Section 1:50

WT1	RT1	FT1
horizontal spruce cladding	spruce decking	spruce plank floor
wood strapping	wood joists	wood sleepers
rigid insulation	wood sleepers	concrete topping
air barrier	roof membrane	membrane
plywood sheathing	protection board	plywood
wood studs/insulation	rigid insulation	wood joists
vapour barrier	plywood	batt insulation
gypsum board	wood joists	plywood
birch veneer plywood	batt insulation	rigid insulation
horizontal spruce cladding	vapour barrier	plywood
	birch veneer plywood	spruce cladding
	spruce cladding	

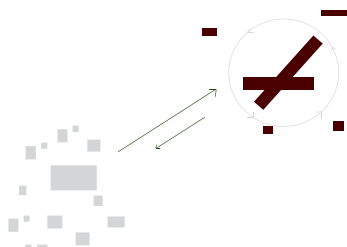
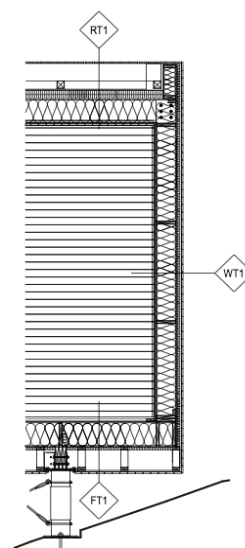
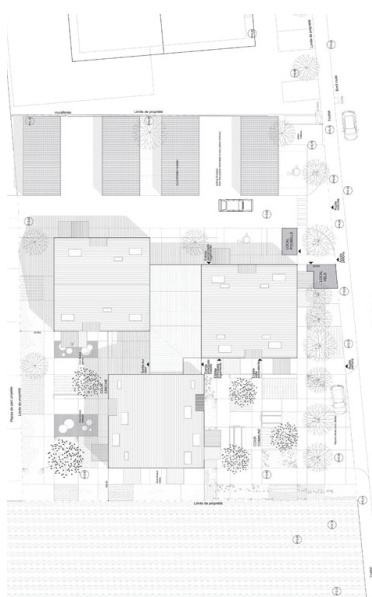


Figure 50: A case study examining *Fogo Island* designed by Todd Saunders, an Inn and Studios created to revitalize and support a rural community and its identity.

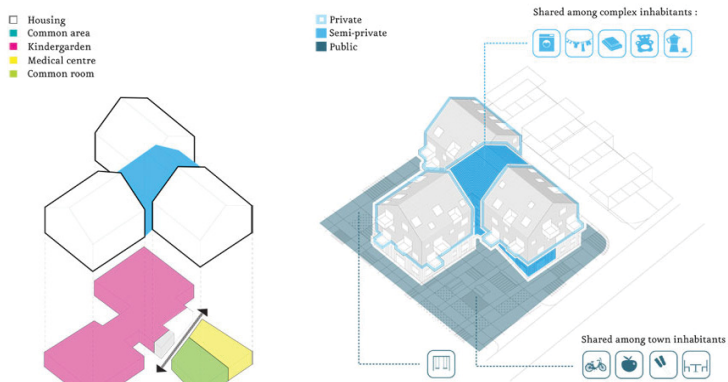
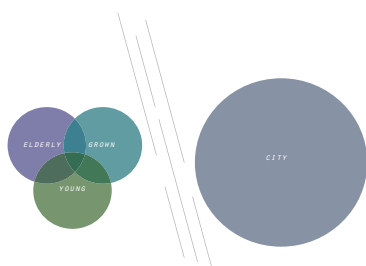
**CASE STUDY:** WILD STRAWBERRIES  
**INTERGENERATIONAL HOUSING**  
**LOCATION:** GLAND, SWITZERLAND  
**ARCHITECT:** MICROCITIES  
**PROJECT DATE:** 2ND PLACE

**DESCRIPTION:** TO TAKE ADVANTAGE OF A MIXED PROGRAM AND THE PRESENCE OF VARIOUS GENERATIONS TO ALLOW FOR THE GROWTH OF A COMMUNITY. CREATING A COMMUNITY ACTIVE, UNITED AND INTEGRATED TO THE URBAN CONTEXT

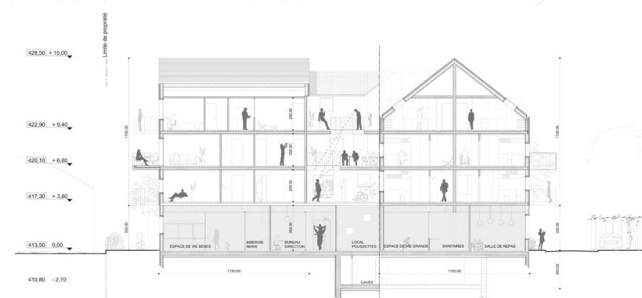


**SITE:** THE SQUARE ON CHEMIN DE LA CHAVANNE IS INTENDED TO BECOME A DAILY MEETING PLACE, CONNECTING THE INTER-GENERATIONAL CENTER AND THE NEIGHBORHOOD, WHILE CREATING A FILTER FROM THE MAIN ROAD.

**PROJECT UNDERSTANDING:** THE OPPORTUNITY FOR CONNECTION AND ACTIVE AND HEALTHY AGEING WITHIN THE COMMUNITY ITSELF SEEMS AS THOUGH IT HAS POTENTIAL. THE CONNECTION WITH THE OUTSIDE COMMUNITY-AT-LARGE SEEMS FRACTURED, AS THOUGH OUTSIDERS MAY NOT ENTER THE COMMUNITY AND FEEL WELCOME.



**TYPOLGY:** THE AIM IS TO CONSOLIDATE THE PRESENCE OF COLLECTIVE SPACE, WHICH IS CURRENTLY INADEQUATE IN THE DISTRICT. THE KINDERGARTEN VARIES THE PUBLIC SPACE AND ALLOWS VISUAL AND PERSONAL CONNECTIONS BETWEEN THE GENERATIONS. THE VOLUMETRIC ORGANIZATION ALLOWS A COMPLEX AND VARIED ARTICULATION OF THE OPEN SPACES, THE PROJECT SHIFTS FROM PUBLIC TO PRIVATE SPACES GRADUALLY, CREATING OPPORTUNITY FOR VARIOUS LEVELS OF COMMUNITY INTERACTIONS.



**SECTION:** VARIETY OF USERS AND ACCESSIBILITY



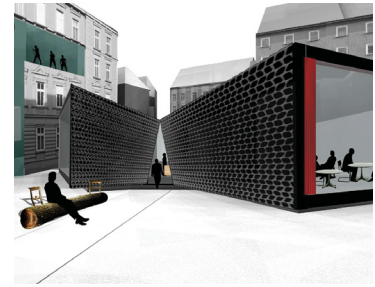
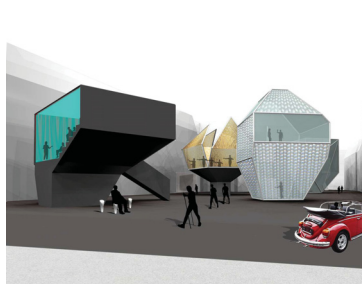
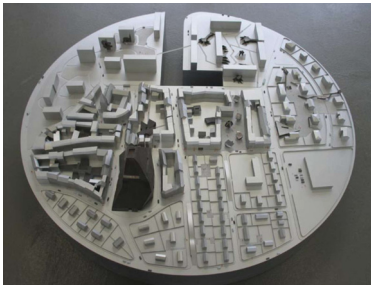
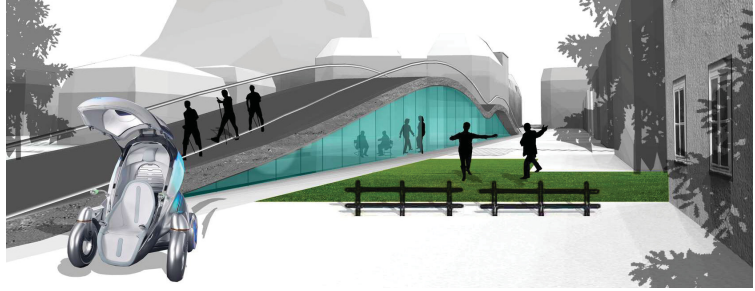
**ELEVATION:** BUILDING TYPOLOGY

Figure 51: A case study examining *Wild Strawberries Intergenerational Housing* designed by Microcities, a multi-generational, multi-program proposal for renewing a community.



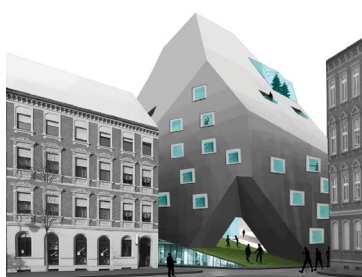
**CASE STUDY:** GEROPOLIS  
**LOCATION:** GERMANY  
**ARCHITECT:** BAUHAUS, MATTHIAS HOLLWICH, & MORE  
**PROJECT DATE:** PROPOSAL - 2013

**DESCRIPTION:** PROJECT DETAILING HOW TOWN PLANNING, ARCHITECTURE AND DESIGN CAN CONTRIBUTE TO A CULTURAL REORIENTATION IN ADDRESSING THE AGEING PROCESS



**PROJECT UNDERSTANDING:** GEROPOLIS IS BUILT WITHIN GERMANY, IN SPACES THAT EXIST WITHIN THE EXISTING FABRIC. THE NEW DEVELOPMENTS ARE SIZED TO FIT THE GAPS IN THE FABRIC AND FORM AN INCLUSIVE CITY THAT CAN CONNECT THE AGEING POPULATIONS WITH OTHER NEIGHBORHOODS.

**TYPOLGY:** THIS PROJECT SHOWS 7 DIFFERENT DESIGN OPTIONS FOR THE COMMUNITY, LARGE SCALE NEW BUILD AND SMALL, TEMPORARY/FLEXIBLE PROJECTS SCATTERED THROUGHOUT THE EXISTING CITY. THE GOAL BEING TO PROMOTE INCLUSION AND CITIES USABLE FOR ALL. CITIES THAT GROW AS THE USERS GROW.



**ZONING:** EVEN LARGE SCALE PROJECTS BUILT WITHIN THE EXISTING URBAN FABRIC, RIDING THE IDEA OF ELDERLY PEOPLES BEING MOVED TO THE OUTSKIRTS OF THE CITIES. EVEN THESE LARGE SCALE PROJECTS HAVE A FOCUS ON ACTIVITY AND GROWING SPACES PROMOTING ACTIVE AGEING.



**PROJECT UNDERSTANDING:** THESE NEXT TWO PROJECTS HAVE AN THEME OF NEEDING A TABULA RASA TO BEGIN. BOTH EXIST EITHER OUTSIDE AN EXISTING CITY ON UNDEVELOPED LAND. PROMOTING A CONNECTION WITHIN THE MEMBERS OF THE COMMUNITY, BUT NOT THE URBAN CONTEXT AT LARGE.

**CONTINUING STUDY:** THIS PROJECT HAS SPURNED OTHER PROPOSALS FROM THE ARCHITECTS. THE FIRST AGEING IN AFRICA IS A SCHOOL SITUATED WITHIN AN ELDER FACILITY FOR AGEING PRIESTS, WHERE THE PRIESTS EDUCATE THE STUDENTS. THE SECOND IS A BOOM CITY IN CALIFORNIA, WHICH PROMOTES AGEING IN PLACE AND HAS FACILITIES AMONGST THE HOUSES TO CATER TO ALL DEMOGRAPHICS.

Figure 52: A case study examining the *Geropolis Proposal* designed by Matthias Hollwich and partners examining how to create spaces for seniors within existing cities.

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