ABSTRACT

Title of Thesis: CAN DESIGN EVOKE YOUTH? EXPLORING PARADIGMS OF INTERGENERATIONAL INTERACTIONS

Emma Isabella Weber, Master of Architecture, 2019

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Society lacks a thorough understanding of the concept of aging. By the time Americans reach their senior years, they have little concept of what life will become as an aging adult. Older adults begin to grow isolated from society both physically and mentally. Health limitations, technological or transportation limitations, and spatial discrepancies generate barriers to seniors, perpetuating a cycle of isolation and loneliness. As the senior population rapidly increases with the aging of Baby Boomers, can architecture break this cycle and stimulate the creation of a society of intertwined generations? This thesis challenges the design of senior housing to become a vehicle through which seniors might reconnect with society through intellectual, physical, and social engagement. Designing spaces that foster new paradigms of intergenerational relationships may become the tool through society is exposed to the beauty and importance of aging.

CAN DESIGN EVOKE YOUTH? EXPLORING PARADIGMS OF INTERGENERATIONAL INTERACTIONS

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Thesis submitted to the Faculty of the Graduate School of the
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LIST OF ABBREVIATIONS

ADA: American Disabilities Act

ANSI: American National Standards Institute

FHA: Fair Housing Act

UFAS: Uniform Federal Accessibility Standards

FGI: Facility Guidelines Institute

IBC: International Building Code

ICC: International Code Council

NFPA: National Fire Protection Association

WHO: World Health Organization

Chapter 1: **INTRODUCTION**

As the world's senior population rapidly increases with the aging Baby Boomer generation, older adults are must face a question of purpose. Where does life take us after retirement? For many, this question comes unexpectedly. Aging is undervalued in society and often ignored. Most commonly, aging is associated with negative connotations such as wrinkles memory loss. Upon retirement, what happens next?

This thesis explores the concept that a psychological construct which instills purpose can improve the health and wellbeing of aging adults. Individuals with a sense of purpose feel a motivation towards goals. Such a construct needs to consider the physical and mental limitations that may accompany aging. Perhaps this construct could become part of a daily routine for seniors in their own dwelling. In this way, architecture can become the direct link to establishing a motivational purpose in the lives of seniors. A thorough study of existing senior living options will assess how housing for seniors may improve and explore paradigms of interactions that are otherwise overlooked in the transition to retirement and beyond. This thesis will analyze the benefits of intergenerational interactions and what both seniors and children might stand to gain. Encouraging interactions with children in educational or playful mediums may realize a purpose to seniors, while children can learn to embrace aging and gain valuable life lessons.

Further research will study the possibility of using architecture to rewrite the standard of a senior's lifestyle. As seniors spend progressively more time at home, independence and accessibility should not be taken away. Different methodologies of

design will be explored in creating spaces that ensure social engagement and minimize isolation. A synthesis of philosophies from communal housing, children's facilities, and senior housing will establish the groundwork for a newly emerging architectural typology. This thesis will look to creating an intergenerational care facility in the city of Baltimore, Maryland that offers living services for seniors, provides care opportunities for the children of the city, and brings together the community in a natural, collective way.

Chapter 2: : PHILOSOPHY OF AGING

WHO: Profiling the Aging Generations

The world is changing, and humans are living longer than ever before. Life expectancies are increasing nationally and globally, and senior populations are increasing rapidly across continents. The years leading into 2030 will welcome an influx of seniors of 65 years or older from Baby Boomer generation, which includes adults born between 1946 and 1964[1] after the end of World War II and soldiers returned home to settle in with new families[2]. Those that fall in this category would range from 52 to 70 years old as of 2018. Figure 2-1 will also show a significant population boom in the millennial generation, with 62 million individuals in this generation compared to the 76 million in the Boomer generation.

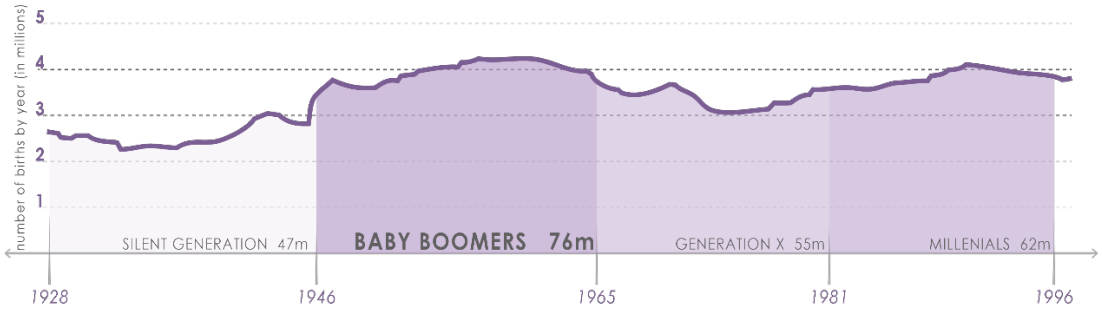

Figure 2-1: Comparing Generational Populations
(Image Source: Author; Data: US Dept of Health and Human Services National Center for Health Statistics)

Seniors in the modern age are typically working longer and later in life: as of 2014, in the age range of 65 years and older, 23% of men and 15% of women are still

[1] Fry, Richard. "Millennials Projected to Overtake Baby Boomers as America's Largest Generation." *Pew Research Center*, 1 Mar. 2018, http://www.pewresearch.org/fact-tank/2018/03/01/millennials-overtake-baby-boomers/.

[2] Thomas, Michael, and Drue Lawlor. *Residential Design for Aging in Place*. John Wiley & Sons, 2008.

in the labor force[3]. This may have influenced a drop in poverty rate as well, dropping from 30% to 10% in the past 5 decades. These statistics do not account for gaps between racial or ethnic groups. These figures are closer to 18% and 19% for Latinos and African Americans, respectively. Health of older adults may be a concern as the Baby Boomers age. Obesity rates stand at 40% for seniors older than 65 years old, and Alzheimer's disease is steeply rising and calling for a greater need for elder care. Compared to previous generations, more older adults are entering retirement divorced. In women aged 65 and older, 13% are divorced, and 11% of men in the same age group are divorced.

The Baby Boomer generation is anticipated to live longer than previous generations, with the national average currently sitting at 78.9 years (refer to Figure *2-2*). This anticipates the next ten years seeing a huge national growth in senior population. Figure __ shows the trends in the upcoming generations and their anticipated numbers in the future. This growth brings a wave of new questions that the nation has not yet faced. How do these seniors age, where will they live, and how will we react?

[3]"Aging Baby Boomers to Face Caregiving, Obesity, Inequality Challenges." *Population Reference Bureau*, 13 Jan. 2016, https://www.prb.org/unitedstates-population-bulletin/.

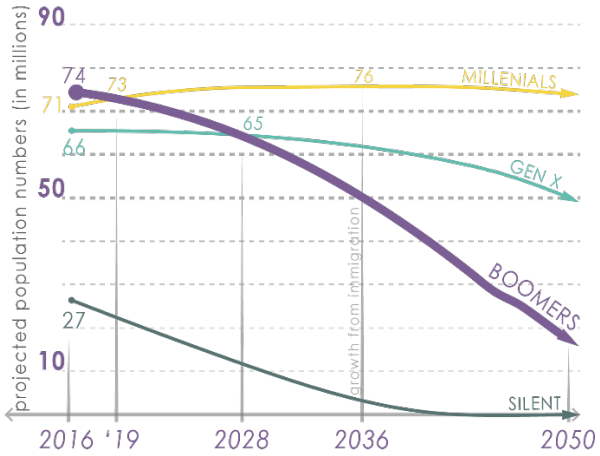

Figure 2-2: Projected Population Growth by Generations
(Image Source: Author; Data: Pew Research Center as of 2014 Census)

WHERE: Aging Around the World

Globally, there is a rising population of the senior demographic. In some parts of the world such as Japan, this rise comes from the decrease in birth rate and overall population. Currently, 26.3% of the Japanese population is over the age of 65, and in the next 12 years that number is anticipated to jump to 32.2% (refer to Figure 2-3)[4]. Meanwhile, the Japanese population aged between 15 and 64 fell by 4% in the years between 2000 and 2010. European countries have similar rising senior populations. Italy for instance has a population of 22.4% over the age of 65, which is an increase from 10 years ago at 20%. The Italian demographic between ages 0 and 14 has remained at 14% since 1999, showing no growth while the remainder of the population ages. Italian pensions consumer 16% of the country's gross domestic product, which is a 5% increase from the rest of the European Union.

[4]Haider, Faraz. "Countries with the Largest Aging Population in the World." *Worldatlas.Com*, 25 Apr. 2017, https://www.worldatlas.com/articles/countries-with-the-largest-aging-population-in-the-world.html.

As a consensus, seniors are living longer due to improved healthcare and technology, and the average person now lives 20 years longer than they did 90 years ago[5]. Developed nations across the globe are learning to adapt to a larger older generation. This comes in the form of economics, healthcare, social and public policy, housing and design, and more. Different cultures have different perceptions of how to handle our elders, and whose responsibility it is to care for them. Countries such as Japan or China have an attitude of filial piety, or respect to one's ancestors, compared to North American societies where the respect of one's elders often stems from preexisting relationships or even the promise of future compensation or inheritance[6] Despite cultural differences, the matter of housing them is a universal need. This thesis will primarily focus on the ways other developed countries have handled the matter of designing appropriate housing and care services in order to serve as precedence for a new model.

[5] Little, William, and Ron McGivern. *Introduction to Sociology - 1st Canadian Edition*. 1st ed., OpenStax College, 2014, https://opentextbc.ca/introductiontosociology/chapter/chapter13-aging-and-the-elderly/.

[6](Little and McGivern 399)

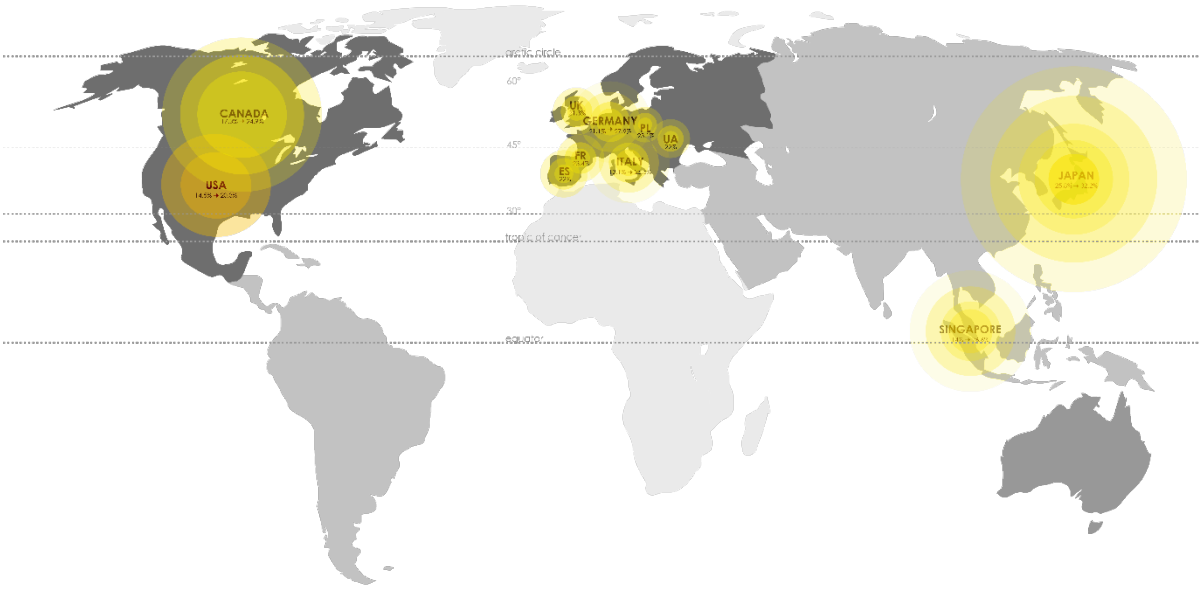

Figure 2-3: Significant Anticipated Growth in Percentage of Senior Population (Aged 65+) by 2030 (compared to Percentage in 2014)
(Image Source: Author; Data: 2010 Census)

Aging in North America in the 1800 and 1900s typically meant living with families, creating homes of multiple generations in which the elders were respected for their experience and wisdom[7]. Today the household has shifted to containing the nuclear family. In 2011 only 3.1% of households in Canada were multigenerational, and this shift is seen in most North American societies as well as many Eastern cultures of developed countries. As Baby Boomers are aging today, they are finding different places to live. There exists a dichotomy of place in old age – a working concept of "aging in place" competes with a trend of migration and creating place in a new space[8]. Gerontologists, scientists who study the aging process, are examining these trends and locating old age.

[7](Little and McGivern 406)
[8] Stafford, Philip B. *Elderburbia: Aging with a Sense of Place in America*. ABC-CLIO, LLC, 2009.

Figure 2-4 and Figure 2-5 show the presence of senior cohorts across the United States. There is a noticeable presence in the Great Plains, rust belt, and New England across these maps. As expected, Florida is the exception in both cases. Big states such as California, New York, and Texas have high numbers of persons over 65, with California at 4 million and New York and Texas both at 2.5 million[9]. States such as Pennsylvania have a high number of seniors, but this is due to the emigration of younger age groups, while Florida continues to rise due to a steady immigration of older age groups.

Looking at the growth of the senior population shares a different story. Figure 2-7 begins to look at how the growth of senior populations shifted in the opposite areas. The 2000 Census showed a massive move towards suburban living, with 31% of that suburban population being Baby Boomers[10]. In this data, it appears Baby Boomers are preparing to "age in place" by moving to a location in which to grow old. Suburban growth has spiked particularly in the new sunbelt states in areas like Las Vegas, Phoenix, and Colorado Springs. University of Michigan demographer William Frey argues that the concept of aging in place will "far outweigh net migration" in the senior growth of the Boomer generation, particularly in suburban environments[11]. .

[9] (Stafford 17)
[10] (Stafford 17)
[11] Frey, William H. "Boomers and Seniors in the Suburbs: Aging Patterns in Census 2000." *The Brookings Institution*, The Living Cities Census Series, Jan. 2003.

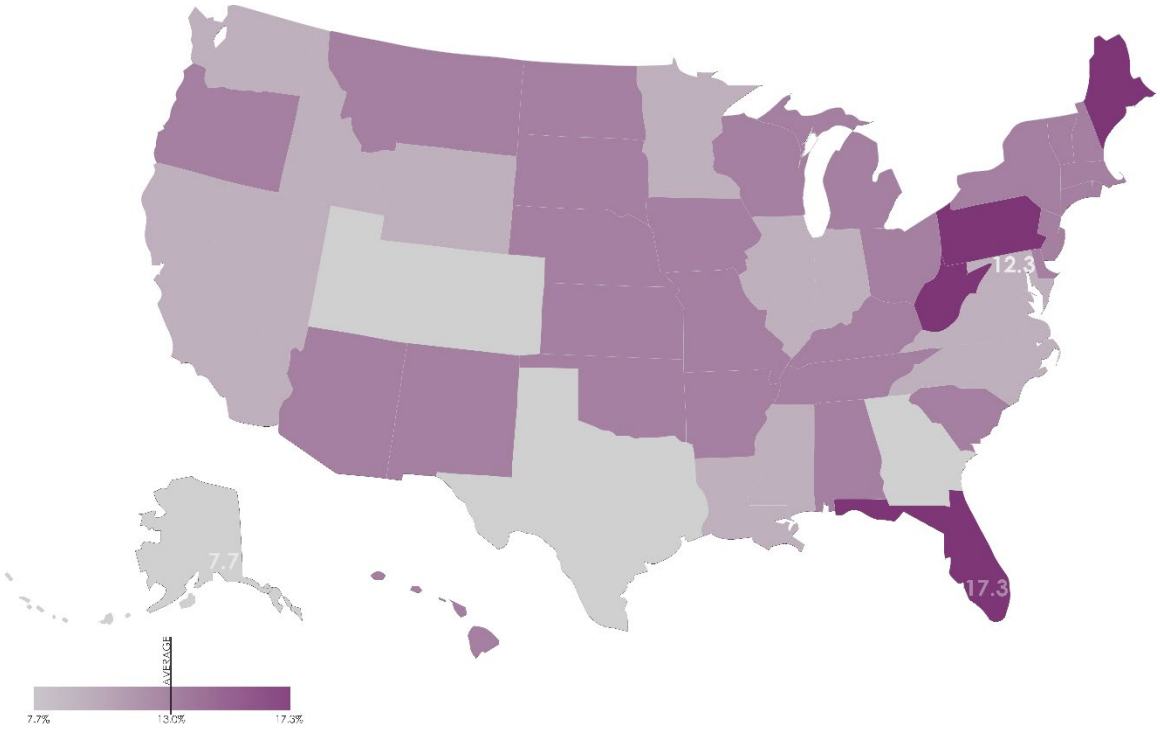

Figure 2-4: Senior Population by State (65+ Years)
(Image Source: Author; Data: 2010 Census)

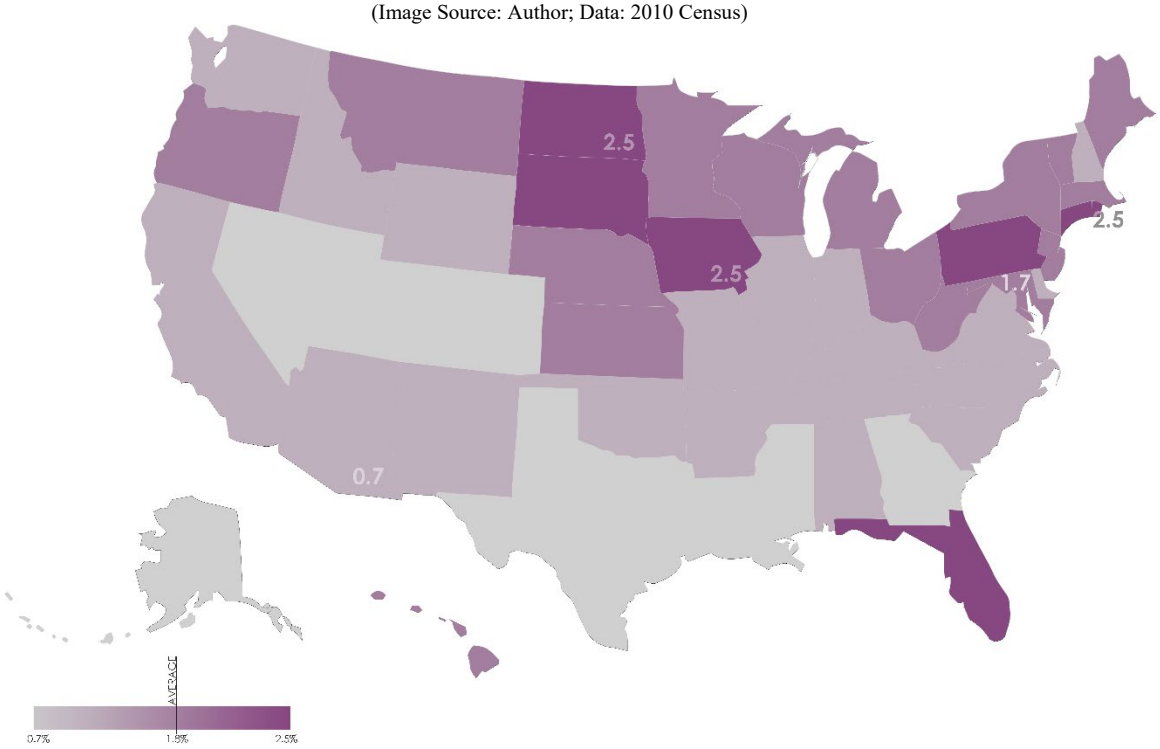

Figure 2-5: Senior Population by State (85+ Years)
(Image Source:

Author; Data: 2010 Census)

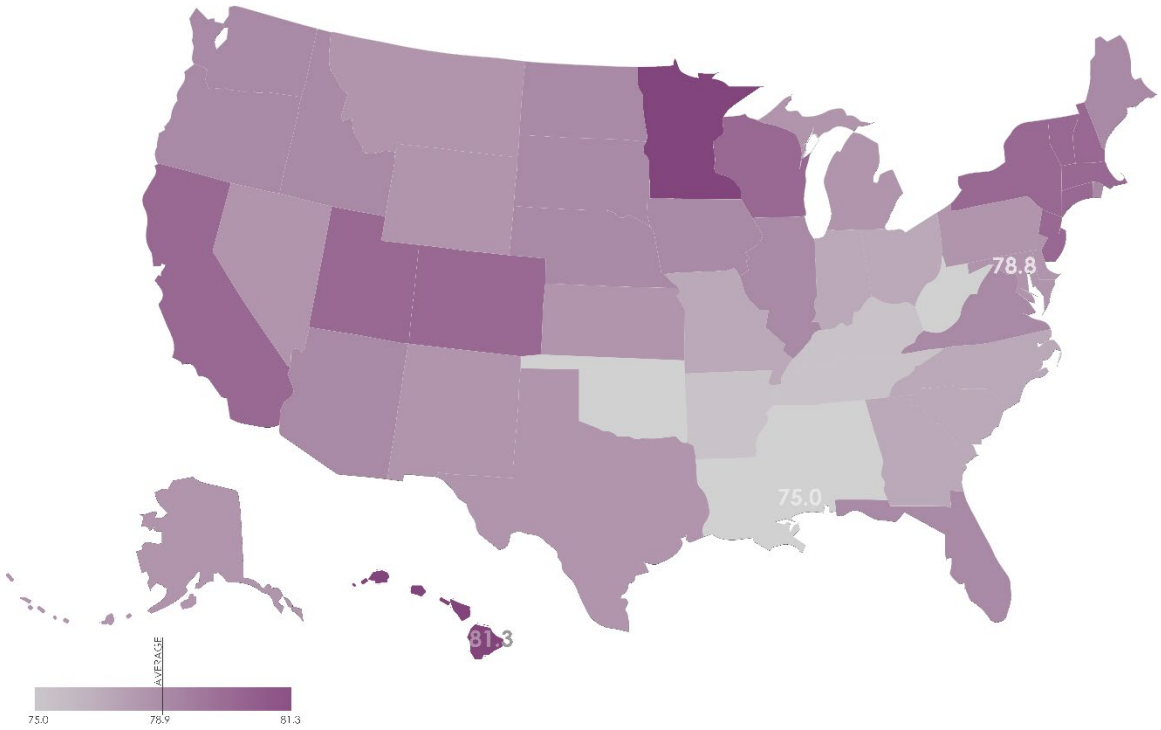

Figure 2-6: Life Expectancy by State
(Image Source: Author; Data: 2010 Census)

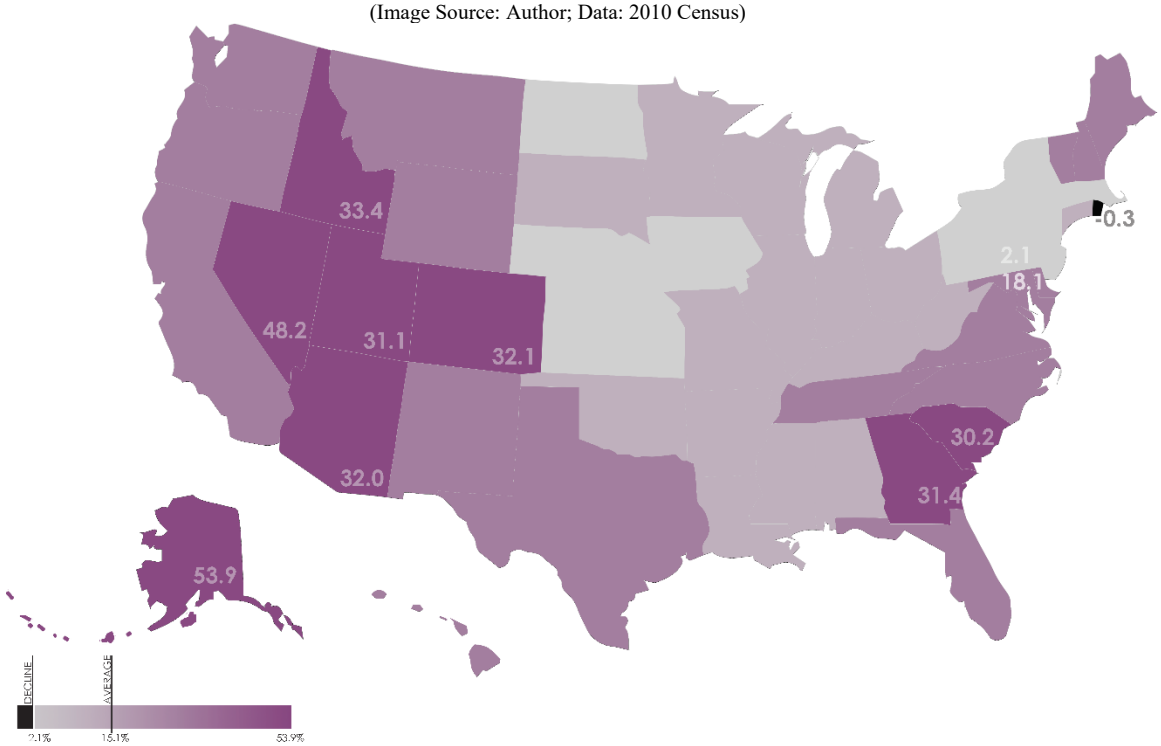

Figure 2-7: Change in Population Aged 65+ Between 2000-2010
(Image Source: Author; Data: 2000 & 2010 Census)

Migration in elder years is typically based on one of two conceptual models studied by William Walters: push-pull or life-course. The push-pull model, as the name suggests, implies there are attractive or unattractive characteristics that drive people in or out of locations[12]. For instance, Florida is typically a location that pulls many seniors due to its warm climate and massive retirement communities. This model can also be attributed to the level of need of the migrant- whether they have sufficient independence or require medium to severe assistance. In some cases, college towns have been attracting more and more seniors due to the array of amenities already in place to serve college students[13]. Amenity seeking baby boomers are also increasingly more interested in downtown areas or urban locations as these spaces are being revamped to host impressive architecture, cultural heritage, specialized services such as healthcare, and a variety of entertainment opportunities.

The life-course model is similar in that it breaks down to the level of capabilities of the user. The model suggests that people will move based on the course of action their life takes and will allow[14]. For instance, one individual in healthy physical shape may migrate to a space with amenities that allow for physical activity, whereas one suffering from chronic illnesses may need to migrate to a strong source of care and services. One consideration is that younger generations, and thus the resulting jobs and economies that follow them, are leading the transition to urban settings. With young and growing healthcare professionals emerging in urban centers,

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[12] Walters, William H. "Place Characteristics and Later-Life Migration." *ResearchGate*, 2002, pp. 243–77.
[13] (Stafford 23)
[14] (Walters 247)

the growth of senior care is on the upswing in response. Baby Boomers are slowly fueling this migration trend[15]. There is growth in the senior population of cities, and there is a possibility of movement in this direction in the future. While the suburbs experienced a growth of 28% in the population aged 35 and older, cities have experienced a 15% growth rate in the same time frame of 10 years (between 1990 and 2000)[16].

According to the Madrid International Plan of Action on Aging, "the urban setting is generally less conducive to sustaining the tradition - al extended family network and reciprocity system than are rural areas."[17] With the shift of family dynamics in many developed countries, the urban setting might be considered an alternative to rural housing or even suburban housing. Seniors become more self-reliant as their adult children are working and supporting younger family members, and they are progressively finding value in being located in an urban environment. In some parts of the world, senior communities and housing has begun to shift towards this direction to adapt to the new culture of aging in society.

This model does not always work in developing countries though, because "older migrants from rural to urban areas in developing countries often face loss of social networks and suffer from the lack of a supporting infrastructure in cities, which can lead to their marginalization and exclusion, in particular if they are ill or disabled."[18] These concerns can be considered a problem of design and urban or

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[15] (Stafford 24)
[16] (Frey 1)
[17] *Political Declaration and Madrid International Plan of Action on Aging*. United Nations, 2002.
[18](*Political Declaration and Madrid International Plan of Action on Aging* 24)

social integration.

HOW: Perception of Aging

The past several decades have generated a new metaphor for this growth: a silver tsunami. The concept of the "silver tsunami" is surrounded by controversy. The term in of itself is one that is questioned for its ageism. Humans tend to simultaneously anticipate and dread the inevitable process of aging. We find ways to hide our age, deny it, and in turn hold ourselves back from the opportunities that age and wisdom might provide us.

To some extent, the growing aging population is reminiscent of a tsunami, in that "it is large, it is beyond our control, and it is predictable"[19]. Unfortunately, this metaphor terminology evokes an image of fear, dread, and destruction, an image misaligned with the reality of aging. According to NPR host Ina Jaffe, adults even feel resentment towards to term "elderly", preferring to hold onto their feeling of youth and ignore the concept of aging[20]. A term that perhaps could have described someone who had grown to reach a vital phase of respect and wisdom is now interpreted as an indication of frailty.

Attitudes towards age develop in early childhood and can carry throughout our lives as a set of assumed truths, which leads into this association of aging with

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[19]Barusch, Amanda S. "The Aging Tsunami: Time for a New Metaphor?" *Journal of Gereontological Social Work*, vol. 56, 2013, pp. 181–84.

[20] Jaffe, Ina. "'Silver Tsunami' And Other Terms That Can Irk The Over-65 Set." *On Aging*, NPR, Inc., 19 May 2014, https://www.npr.org/2014/05/19/313133555/silver-tsunami-and-other-terms-that-can-irk-the-over-65-set.

shameful steps closer to death[21]. Author Ashton Applewhite discusses how this ageism is a major issue that society must address if we want conditions to improve for our older adults and eventually our own futures. Aging is an accomplishment that is shadowed by the dread of wrinkles or feeling of incompetency. The reluctance to admit aging creates a divide between older and younger people – aging adults want to dissociate with the "other" adults who have accepted their old age. This denial and marginalization internalizes a feeling of hopelessness and often results in older adults feeling that they do not deserve to ask for help, or rather are simply afraid to admit need for assistance[4]. This can perpetuate and drive a physical, communicative, and emotional divide between older adults and younger populations, beginning a dangerous downward spiral of isolation.

A Japanese psychiatrist Takeo Doi defines a Japanese term *amaeru* as the existence of particular interpersonal relationships that are most often found in the home, the most intimate of settings, in which there is a putative dependence[22]. This dependence provides the sense of comfort and evokes a person's true self, in which they might act more playful or childish. In some cultures, *amaeru* exists primarily at the beginning and the end of life. In other cultures, these types of relationship can manifest at countless points in one's life. Dependence is a phenomenon of time but also of place and circumstance. A society that associates aging with decrepitude may find virtue in recognizing the therapeutic value of interdependence.

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[21] Applewhite, Ashton. "'Who Me, Ageist?' How to Start a Consciousness-Raising Group." *ThisChairRocks*, 1 July 2018, https://thischairrocks.com/blog/.

[22] Stafford, Philip B. *Elderburbia: Aging with a Sense of Place in America*. ABC-CLIO, LLC, 2009.

Interdependence may be lost as seniors grow isolated among society. Isolation can be categorized into two types: physical isolation and perceived loneliness. Physical isolation is often the result of numerous causes. According to AARP, nearly a third of seniors aged 65 and older live alone, and that number jumps to over half of the population when the age group shifts ten years later[23]. Some of the major causes of this isolation stems from societal barriers, such as the societal perception of aging and the resulting inability to engage or connect with seniors. Mobility barriers, transportation difficulties, and the inability to relocate themselves independently also isolate seniors physically. A smaller social network as a result of physical isolation could also create a higher risk of mortality due to a senior's inability to reach out for medical attention[24].

[23] AARP. "What Is Isolation?" *Connect2affect*, https://connect2affect.org/about-isolation/.

[24]Stevenson, Sarah. "20 Facts about Senior Isolation That Will Stun You." *A Place for Mom*, 5 May 2017, https://www.aplaceformom.com/blog/10-17-14-facts-about-senior-isolation/.

Figure 2-8 Exigency to Address Social Isolation and Subjective Loneliness in the Senior Population

(Image Source: Author; Data: AARP; Government of Canada, National Seniors Council)

As older adults transition into a stage of retirement, their health or the health of similar aged friends begin to decline, or they begin to feel disconnected to the trends of their surroundings can all attribute to feelings of isolation and subjective loneliness. Working as a neurologist and psychologist from the University of Chicago, Doctor John Cacioppo has conducted extensive research on the link between perceptive loneliness and cognition and health[25]. Their research found that perceived social isolation, or loneliness, relates directly to the quality of social interactions rather than quantity. Lacking interpersonal relationships as discussed earlier can play

[25]Cacioppo, John, and Louise C. Hawkley. "Perceived Social Isolation and Cognition." *Trends in Cognitive Science*, vol. 13, no. 10, 2009, pp. 447–54.

a major role, along with cultural and social needs as well as the psychological understanding of aging from childhood. A more thorough list of causes of isolation can be seen in Figure 2-9. Some of the effects of subjective loneliness include increased blood pressure, changes in environmental perception and life satisfaction, and even predictable changes in IQ or depressive symptoms. These effects will be analyzed further in Chapter 3: : ANALYZING IMPLICATIONS OF AGING in order to gather a greater understanding of the health implications of aging.

	TRANSPORTATION CHALLENGES	HEALTH & WELL-BEING	LIFE TRANSITIONS, ROLE LOSS OR CHANGE	SOCIETAL BARRIERS	LACK OF ACCESS & INEQUALITY
CAUSES OF ISOLATION 	lack of accessible & affordable transportation retirement from driving	untreated hearing loss mobility impairments frailty poor mental health	leaving work loss of partner or friends becoming a caregiver	ageism lack of opportunities to engage and contribute	poverty rural living marginalized groups
RESPONSES TO REDUCE ISOLATION 	volunteer based ride programs livable / age-friendly communities	fall prevention programs chronic disease self-management active aging engagement	support groups lifelong learning senior centers creative / artful aging	intergenerational programs lifelong learning policies to support older workforce	resiliency & empowerment models home-sharing models technology training urban transition

Figure 2-9: Assessing Causes and Potential Ways to Address Isolation as a Result of Aging
(Image Source: author; Data: AARP Foundation)

When studying the aging process, it is crucial to pull away from the negative connotations and develop an understanding of the positives and benefits that come with aging. Bloggers like Jeff Anderson want to shine a light on the best things that come with growing gray, overshadowing the aforementioned complications with a

positive outlook[26]. Anderson draws a focus on the possibilities that come with time-retirement means having time to pursue dreams and aspirations that the business of working adult life might not otherwise allow. Living for so many years also comes with knowledge, whether that be of the world around you or even of yourself and your peers. An article in the Smithsonian discusses a study conducted with subjects in their 20s along with subjects in their 60s[27]. The study involved a gambling game and was intended to analyze the subjects' mental and emotional control abilities. Unlike their younger counterparts, the 60 year old subjects were less likely to agonize over a loss and risk a subsequent round with big risks. Another study by the University of Illinois found that despite decline in short term memory and visual spatial processing, seniors over the age of 60 had sharp mental skills that allowed them to expertly navigate traffic control, balancing the tasks of avoiding collisions and directing efficient travel paths.

Something that can really stand out to seniors is the feeling of belonging, purpose, and accomplishment. John Lennon writes the following lyric: a working class hero is something to be. Small accomplishments, small meanings in life, can truly make the difference to the quality of life towards the end of one's life. Everyone has something(s) they live for, and it's especially important to ensure our oldest adults maintain that purpose and sense of self. There are countless groups that are

[26]Anderson, Jeff. "10 Best Things about Growing Old." *A Place for Mom*, 2 Aug. 2017, https://www.aplaceformom.com/blog/best-things-about-growing-old-9-4-13/.

[27]Fields, Helen. "What Is So Good about Growing Old." *Smithsonian Magazine*, July 2012, https://www.smithsonianmag.com/science-nature/what-is-so-good-about-growing-old-130839848/.

directing their attention to meeting the needs of this upcoming population shift, whether it be financial, economic, health care, or spatial. This paper will focus primarily on gaining a deep understanding on the psychological perception and impact of aging, the physical and cognitive health needs of the aging population, and how architecture and spaces can begin to address these concerns in a productive and qualitative way. Ideally, through understanding and design, this paper can generate a new way to restore a sense of meaning to seniors.

Chapter 3: **ANALYZING IMPLICATIONS OF AGING**

Physical Expectations of Aging

"If the second half of the twentieth century focused on the education of the baby boomers, the first half of the twenty-first century will be about funding their health and aged care and about housing this population."[28]

Aging comes with many things, and one of the biggest is the changes in our health and wellbeing. Our physical and mental health change, and it is important to understand these changes in order to design spaces that might accommodate them.

While there is no set time to which one becomes an "elder" besides the common conception that the age of 65 marks retirement, elder years might be classified as the time when a person "is unable to independently perform certain basic, personal, routine functions- referred to as 'activities of daily living'."[29] These activities range from eating and drinking to using the bathroom to sleeping. Rate of aging is naturally affected by numerous elements such as diet, genetics, geographic location, access to healthcare and education, and lifestyle.

Many within the Baby Boomer cohort aspire to uphold active lifestyles through age, but this can only be achieved through proper understanding of the implications of aging. With aging comes changes of the body and mind that present new limitations. Those limitations can be grouped into the following groups: mobility, sensory, and cognitive. Figure 3-1 shows how these different types present themselves in seniors.

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[28] Andershon, Jeffrey, et al. *Design For Aging*. John Wiley & Sons, 2012.
[29] Thomas, Michael, and Drue Lawlor. *Residential Design for Aging in Place*. John Wiley & Sons, 2008.

Figure 3-1: Impairments and Disabilities Commonly Affecting Aging Seniors
(Image Source: Author; Data: Skiba and Zuger)

Motor impairments impact mobility and locomotion, and these can be visible i.e. malformation to limbs, or invisible i.e. muscular or central nervous system dysfunction.[30] While visible malfunctions may occur from injuries or accidents, most of aging involves biological changes that are either molecular or cellular, also known as *primary aging*, or the result of controllable factors i.e. diet and exercise known as *secondary aging*.[31] Physical, superficial markers of age can begin to show earlier than

[30] Skiba, Isabella, and Rahel Zuger. *Barrier-Free Planning*. Birkhauser Verlag AG, 2009.

[31] Little, William, and Ron McGivern. *Introduction to Sociology - 1st Canadian Edition*. 1st ed., OpenStax College, 2014, https://opentextbc.ca/introductiontosociology/chapter/chapter13-aging-and-the-elderly/.

anything else such as wrinkles or graying or loss of hair. Aside from that, mobility may become impaired as a result of lack of exercise or the development of chronic illnesses. The most common chronic illnesses that appear in elders include arthritis or rheumatism (51% of ages 75 years and older), hypertension (40% of 65 years and older), cataracts (28% of ages 75 and older), increased back pain, and heart disease.[32] The likelihood of strokes increase with age as well, which can result in partial paralysis and cerebral damage, creating cognitive impairments as well. On another note, there is research that suggests that nearly one in five new cases of AIDS occur in adults over the age of 65.[33] In males in particular, primary aging impacts sexual performance in most aging men, but luckily there is a strong basis of research and medical treatment to cope. Unfortunately, there is less research to understand or support the physical or sexual changes that impact the female gender.

Sensory capabilities gradually change with age as well. More than 38 million people over the age of 40 have significant vision related issues; hearing loss affects the lives of 25% of seniors over the age of 65, and 50% over the age of 75, contributing heavily to social isolation; and the capacity to smell is often reduced by nearly half by the age of 80.[34] Vision impairment can range from mild to complete blindness, and includes night blindness or color blindness, which can appear or progress with age.[35] Hearing impairments also range from mild to severe, and loss of hearing can directly relate to speech ability, as well as loss of balance or feeling of

[32] (Little and McGivern 410)
[33] (Little and McGivern 412)
[34] (Thomas and Lawlor 33)
[35] (Skiba and Zuger 14)

dizziness. Haptic impairments may also occur, and can be either exteroception, defined as tactile perception, or proprioception, defined as introverted perception within one's body and relating to coordination or movement.[36]

Disruptions in cognitive abilities are typically directly correlated to the previous two categories of impairment. Loss of senses can result in ability to recognize or visualize surroundings and properly formulate actions, words, or conclusions.[37] One of the most prevalent cognitive dysfunctions in seniors is dementia. Nearly 30% of those over 90 suffer from some form of dementia, with a larger percentage of women than men affected at nearly 66%. This can further initiate social or emotional responses. With the rise of the senior demographic, this number can surely be expected to grow.

Senior Mental Health Conditions and their Origins

Physiological changes develop at different rates in a person's life, and the main contributing factors can be internal or external. External factors can include injuries from accidents, abuse from spouses or children, age discrimination or stereotyping, or changes in government programs or economics that impact income, medical support, or social construct[38]. As discussed in Chapter 2: : PHILOSOPHY OF AGING, the fear and denial of aging has a hugely negative impact on the actual aging process. The term gerontophobia has been used to describe this fear, defined as "an irrational [fear or] hatred of older people by society and by themselves"[39]. The

[36] (Skiba and Zuger 15)
[37] (Skiba and Zuger 16)
[38] (Thomas and Lawlor 35)
[39] Bunzel, Joseph H. "Note on the History of a Concept - Gerontophobia." *The Gerontologist*, vol. 12, no. 2, July 1972, p. 116.

author Joseph Bunzel who studies this concept for a living stresses that this "social neurosis" is massive and all-inclusive, affecting Americans of all races, ages, and socioeconomic groups. It plays a role in medical and helping professions as well as the legal profession. The reduction of Social Security benefits, for instance, can induce immense stress on seniors who rely on this as a source of income in their retirement. Negative or condescension from younger family members is a frequent concern as well, as younger generations may become blind to the difficulties of aging and the isolation that comes with technological or social barriers. This discrimination can make elders feel vulnerable and builds those walls higher between generations, perpetuating the cycle of isolation and consequential loneliness.

Naturally, internal factors play a big role on the developmental changes of aging. Susceptibility to chronic conditions, genetic conditions, or a loss of balance or flexibility impact mobility and psychological outlook.[40] Unfortunately, a gradual loss of cognition, such as concentration or memory, can produce similarly negative results, particularly estrangement from family and friends. As we age, our ability to learn may become impaired as well, which can affect our ability to adapt to the changes of society, primarily technological advances that typically set the younger generations apart. A disconnect from society and from our loved ones can enhance perceived loneliness, which in turn increase the chance of developing dementia by 60%, and may even increase the risk of early death by 26%[41].

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[40] (Thomas and Lawlor 34)

[41] AARP. "What Is Isolation?" *Connect2affect*, https://connect2affect.org/about-isolation/.

A large study was conducted on 823 dementia-free older adults to understand global cognition and memory in relation to perceived loneliness.[42] The study showed that lonelier patients, according to their personal perception of loneliness, performed poorer on cognitive performance than their peers. Loneliness was associated with greater cognitive declines in every domain tested except working (short-term) memory and episodic performance. These domains included global cognition, semantic (long-term) memory, perceptual speed, and visuospatial ability. In fact, during the 65 month study period, 76 of the 823 participants developed dementia. This model suggested loneliness increase risk of developing Alzheimer's regardless of independent variables including age, sex, education, and objective isolation. This indicates that there is more to be addressed than objective isolation, and that grouping seniors within society does not automatically reduce or eliminate the presence of perceived loneliness.

[42] Cacioppo, John, and Louise C. Hawkley. "Perceived Social Isolation and Cognition." *Trends in Cognitive Science*, vol. 13, no. 10, 2009, pp. 447–54.

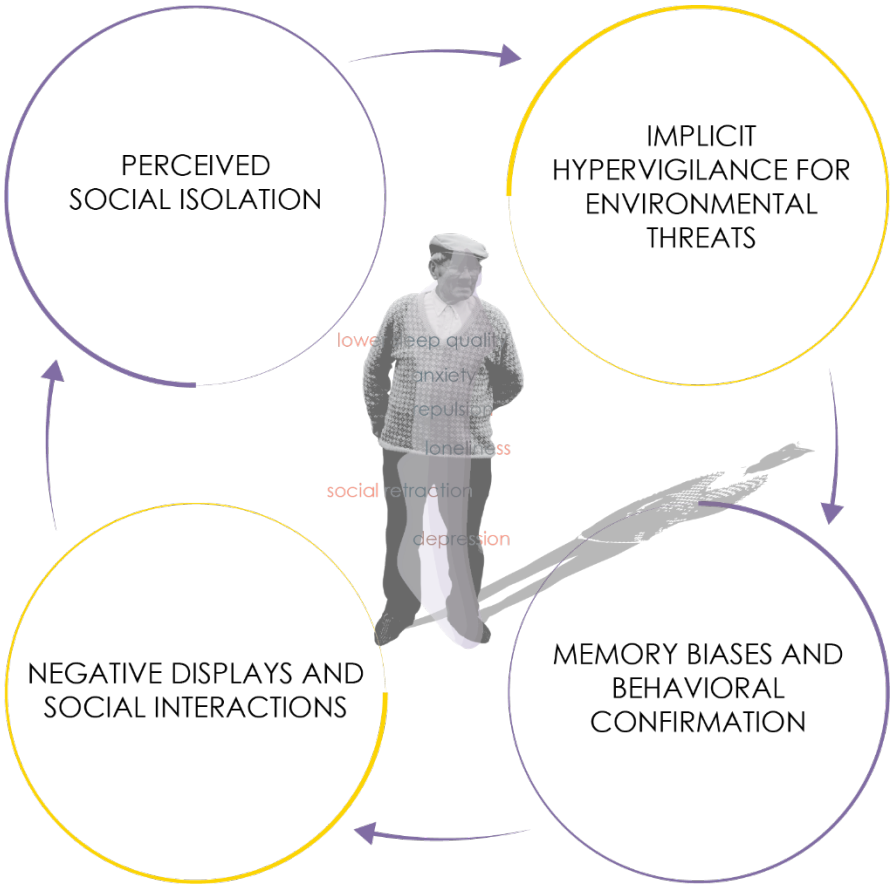

Figure 3-2: The Impact of Loneliness on Human Cognition
(Image source: Author; Data source: Cacioppo and Hawkley)

Another study looked at the correlation of loneliness and depression and anxiety. A sampling study of participants were beeped 9 times a day every day for one week, and the results of these check-ins showed that individual who felt lonely would feel negative or anxious after social interactions as compared to their nonlonely peers.[43] It is likely that social interactions induce a greater awareness of the individual's inner emotions, needs, and negative feelings. Lonely individuals may view the world as "threating and punitive", and this can cause people to feel more anxious, fear negativity, and even project anger or negativity towards those around them, potentially further driving them away into a pit of loneliness. Thus, one could

[43] (Cacioppo and Hawkley)

argue the common media stereotype of older adults as grumpy or moody towards others is not fully ungrounded in reason, but rather a misunderstood and exaggerated portrayal of the harmful cycle of loneliness and paradoxically self protective and isolating reactions towards others. This cycle is represented graphically in Figure 3-2.

Spatial Considerations of Seniors

Author Philip B. Stafford generated 4 domains that establish an elder-friendly community. These overarching goals, listed in Figure 3-3, include "addressing basic needs, promoting social and civic engagement, optimizing physical and mental health well being, and maximizing independence for frail and disabled"[44]. These categories developed from a list of survey questions distributed through phone calls to elderly members of 10 different communities, some of which include Chicago, IL, Allentown, PA, Raleigh, NC and Long Beach, CA. The research aimed to find a diverse range of geography, demographics, and size within the communities. The categories gathered from this data was a collection of thoughts from the elders who have firsthand experience.

[44](Andershon et al. 33)

Figure 3-3: Objectives to Establish Elder Friendly Community

(Source: Graphic by author; (Stafford 33))

The first objective involves basic needs such as affordability, mobility, accessibility, and safety. Primarily, these spaces need to accommodate assistive services and provide a sense of security within the space. This comes both from security of the environment of the space as well as the particular spatial organization. For instance, an elder needs to feel safe within and around their home, thus appliances or storage must be easily accessible without the need to climb or reach uncomfortably and risk the danger of falling. This category also includes the opportunity to access

essential services safely within their neighborhood, such as grocery stores. It is crucial to ensure the elders are not skipping meals due to lack of money or access.

The second objective covers the importance of building and maintaining healthy relationships. This can be within a larger community i.e. volunteer work, your own living community, or even simply your family. Having a network of trusted friends and loved ones can begin to mend the barrier of social isolation that can arise from lack of contact and relationships. As discussed earlier, societal perception must adapt to accept aging in order to better understand it and prevent the confusion and disappointment that often arises once you reach senior status. This can begin with a stronger connection to the people who understand the aging process most.

The third objective discusses physical and mental well being as discussed earlier this chapter. More specifically, participants in the survey mentioned the access and proximity to health services, as well as the promotion of positive health practice. For instance, the survey specifically mentions screening services for physical or mental health issues, and lacking obstacles to obtain that service. Additionally, physical activity is available and encouraged, as well as mental health care. A community should supply countless opportunities for elders to move and keep their minds and bodies engaged.

The fourth category is one of particular importance as it discusses deliberate spatial qualities that encourage independence despite disabilities. In the words of authors Isabelle Skiba and Rahel Züger, “disability is generated through their surrounding environment”[45]. In an elder-friendly community, designers must create

[45] (Skiba and Zuger 9)

an environment that minimizes disability. The following figures break down some of the core considerations for designing interior and exterior spaces around mobility aid limitations.

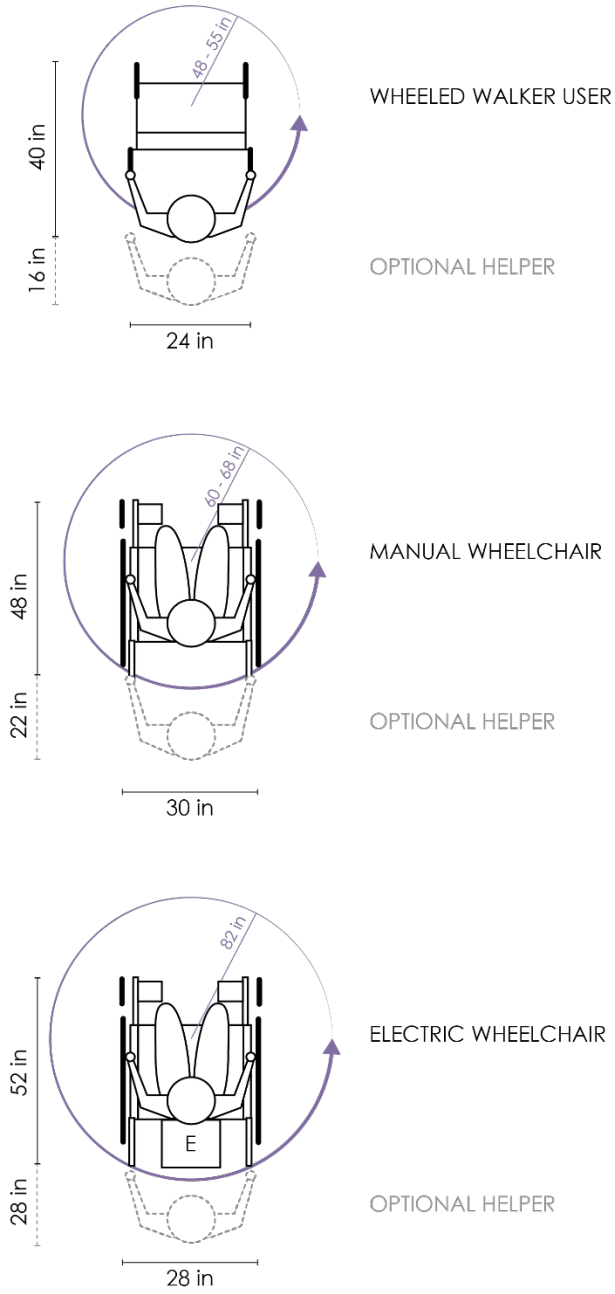

Figure 3-4: Movement Restrictions with Mobility Aids
(Image source: author; Data: Skiba and Zuger 27)

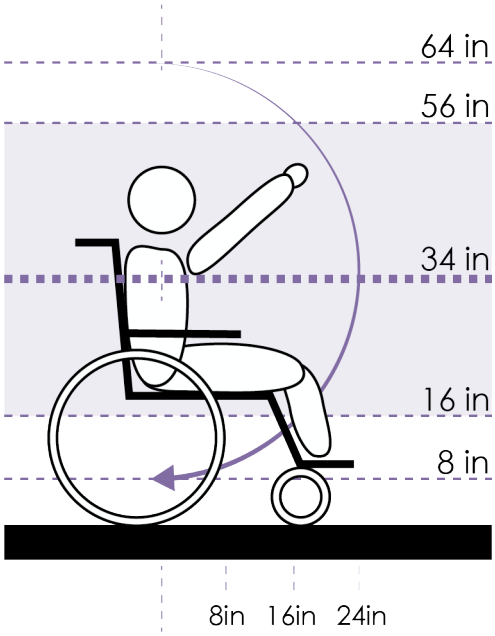

Figure 3-5: Radius of Reach from a Wheelchair
(Image source: author; Data: (Skiba and Zuger 29)

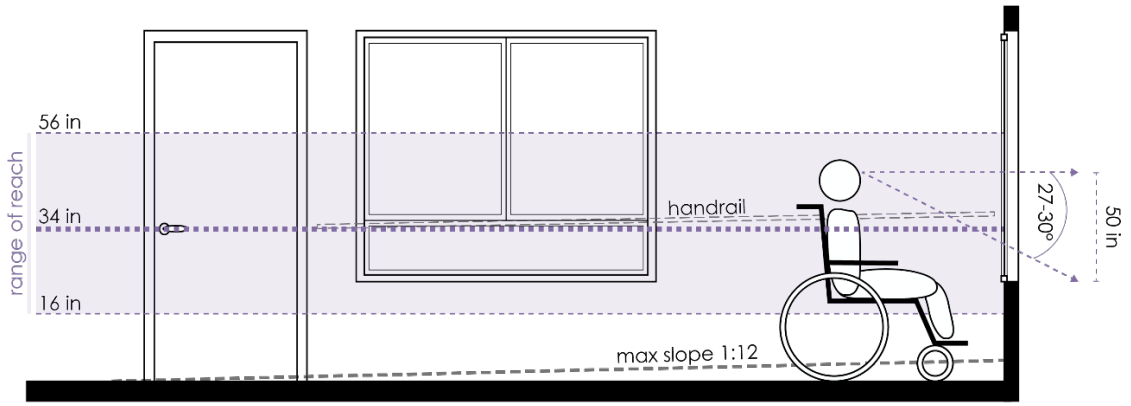

Figure 3-6: Height of Controls and Window Openings and Maximum Ground Slopes
(Image source: author; Data: (Skiba and Zuger 42)

As a general design guideline, spaces designed for disabilities and elderly should be flexible, accommodating, and open. Rooms should be "functionally and constructively able to accommodate any equipment to help with motor and sensory limitations"[46]. For starters, the ground plane should have minimal (if any) changes as

[46] (Skiba and Zuger 25)

to avoid tripping or inconvenient movement. Naturally, whenever stairs are necessary, properly sized elevators must accompany them. Spaces are designed to create comfortable, familiar environments that fall within the physical ability range of the disabled, particularly those in a wheelchair or with other walking aids. National design codes such as Americans with Disabilities Act (ADA), ADA Accessibilities Guidelines, American National Standards Institute (ANSI), Fair Housing Act (FHA), Uniform Federal Accessibility Standards (UFAS) and more account for these limitations and restrictions and designate an extensive list of rules to follow, designating sizes and locations for everything from thresholds to passages to thermostats[47]. For instance, system controls and working surfaces need to be within reach and visual range of an individual sitting in a chair as to avoid stretching the spine beyond a comfortable range. These rules apply heavily to places such as the bathroom, which is considered one of the most dangerous places in the residence, especially for the elderly or individuals with disabilities[48]. The following figures depict some of the crucial spatial elements to making a barrier free restroom.

[47] (Thomas and Lawlor 35)
[48] (Thomas and Lawlor 129)

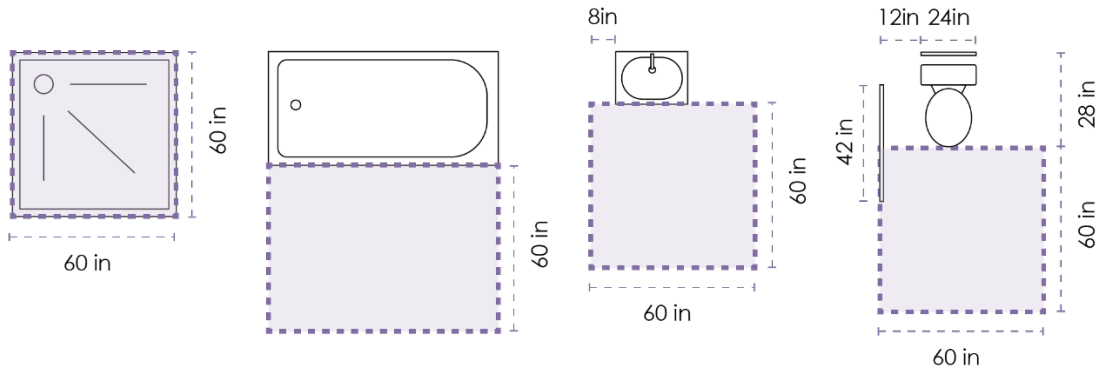

Figure 3-7: Wheelchair Accessibility in a Bathroom
(Image source: author; Data: Skiba and Zuger 58 & Thomas and Lawlor 138)

Additional figures depicting important accessibility design guidelines can be found in APPENDIX A: CODES AND SPATIAL GUIDELINES.

Personal spaces must also consider storage space that is easily accessible. Residents in an electric wheelchair need to have sufficient charging stations, and systems, particularly elevators, must keep the weight of electric wheelchairs in mind[49].

On top of mobility impairments, spatial design must also consider visual and auditory impairments. Protrusions and unusual paths of movements create a danger for elders who have loss of vision, so clear and intuitive circulation is critical. One method of designing for visual impairments is through the use of color, a tool that is also useful in early childhood developmental tools. Colors generate an innate connotation in our brains can indicate good versus bad, safe versus unsafe. Similarly, they can be easily distinguished between each other and replace unclear or unreadable written signs, such as directional signs towards a garage rather than towards the front

[49] (Skiba and Zuger 28)

lobby[50]. Natural light is also an excellent resource in producing similar signals in addition to generally creating a safer, more welcoming environment and illuminating spaces for visual comprehension. Shadows should generally be avoided in spaces the residents will be occupying. Visual signals should accompany any auditory signals as to better serve residents who may also suffer from hearing impairments.

Design for visual impairment can also help elders with cognitive impairments. Simplicity is helpful for residents to navigate, particularly in looping or circular paths that minimize turnoffs or wander spaces. Simplicity is also beneficial for visual comprehension, so smaller spaces can be easily understood as compared to large atria[51]. This is also true in spatial arrangement. Grouping similar activities within a confined amount of space reduces the need to navigate beyond a comfortable level of movement.

Finishing details play a role in comfort and safety level in a barrier free space. Whether it be a softer or more absorbent flooring for softening falls or absorbing environmental sound, or particular choices of colors and patterns, the finishes of a space may be specifically allocated based on the program it might host. Surfaces in a bathroom, for instance, have a high risk of slipping when wet, so the finish on a bathroom floor could have a treatment to increase the slip coefficient[52]. On the contrary, hallways might have a carpeting of minimal pattern and contrast to avoid visual confusion paired with walls of a starkly different color to differentiate between

[50] (Skiba and Zuger 31)
[51] (Skiba and Zuger 34)
[52] (Thomas and Lawlor 148)

planes[53] The possibility of specifically designed environments and resident-selected finishes might be considered as a bonus design feature. The positive influence of a space that is designed by and belongs to you is called milieu therapy, and it can help reduce insecurity in a new space and help create a sense of home and comfort[54].

[53] Turgeon, Mary E., et al. "Interiors for Senior Living Communities." *Health Facilities Management Magazine*, Feb. 2015, https://www.hfmmagazine.com/articles/1480-interiors-for-senior-living-communities.

[54] (Skiba and Zuger 34)

Chapter 4: **EXPLORE INTERGENERATIONAL INTERACTION**

International Intergenerational Models

In many cultures, maturation creates centripetal and conservative forces that aim to preserve the purity of the culture, and in turn reject adaptation and change. This culture, a purebred culture, rarely succeeds over time due to instability to outside forces and change.[55] This philosophy directly translates into social cultures and business ventures. Adapting to change through incorporating heterogenous elements such as a 'mongrel culture' might allow for growth and stability.

There are three common structures to the multigenerational housing amongst families across the world[56]:

1. *Boomerang families*- returning to or remaining in the home of a parent for care provision or economic situation
2. *Skip generation*- grandparents caring for grandchildren and vice versa due to outside forces such as epidemics that attack the generation between
3. *Sandwich generation*- families that care for either end of the life course, often facing economic hardships

Different cultures are more inclined to follow one of these structures. Three different examples include France as a boomerang family structure, South Africa as a skip generation structure, and Singapore as an example of the sandwich generation.

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[55] Kurokawa, Kisho. *Philosophy of Symbiosis*. Academy Editions, 1994.
[56]Kneale, Dylan. Global Perspectives on Multigenerational Households and Intergenerational Relations. ILC Global Alliance, Mar. 2012.

In France, intergenerational relationships are a dominant cultural aspect and create boomerang families. For many French families, the older members are indeed separated in independent living spaces, but they play a pivotal role in care of the younger family members.[57] This is partially due to increased life expectancy and the healthier lifestyles of older adults, allowing them to be more engaged within the family. In this structure, there is a healthy balance of dependence in which 50% of grandparents report providing moral and financial support; meanwhile 50% of older adults receive care from their children as they age. The support the younger family members provide older family members is crucial to their psychological and physical health; continued attention via phone calls, visits, and shared activities, can slow disease and prevent isolation. Most older adults live separate from their families. By 2012, 80% of the generation aged 65 and older lived alone, and 6% lived in retirement homes, with a greater percentage of women living alone than men at 40% versus 16%.[58] Despite the separation, importance of familial connection remains strong in the French culture and benefits the younger and older generation.

South Africa families function as a 'skip generation' due to outside circumstances. Compared to France, over 50% of nonwhite elders older than 60 years older live in households with three or more generations.[59] Fewer than 5% live alone. Co-residence is fluid due to the influx of schoolchildren through middle-aged adults towards urban settings. The youngest children live with grandparents in a rural area to be cared for. Unfortunately, this dynamic is often instead a result of parents falling

[57] (Kneale 17)
[58] (Kneale 17)
[59] (Kneale 34)

victim to disease like AIDS, leaving the children in the hands of the grandparents. A new trend is emerging in which, in cases where the family can afford it, adult children are purchasing units in retirement villages for their parents to bring them closer to the younger family members and provide them professional care.

In Singapore, family is the core of culture, and most families are considered a sandwich generation. In a 2009 survey, over 94% of the residents over the age of 60 live in two or three generation households. 25% live specifically with their children and grandchildren. This number has dropped primarily because of the lower fertility rates and increased lifespan over the subsequent ten years.[60] However, despite this drop, there remains a trend of young adults moving into apartments close to the homes of their parents. Particularly in three generation households emerge the sandwich generation where younger members are squeezed between their parents and their children. Because of the culture of filial piety, younger generations are expected to care for their elder family members, and in multigenerational households care can be provided daily to aging parents.

European, African, and Asian cultures vary in familial relations, and the model of family relations, including child or elder care responsibilities, relies heavily on welfare state arrangements.[61] Typically, the more outside resources provided for child or adult care results in a reduced expectation of care responsibilities on healthy or capable relatives. Additionally, wealthier families can afford to encourage family

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[60] (Kneale 30)

[61] Dykstra, Pearl A. "Cross-National Differences in Intergenerational Family Relations:
The Influence of Public Policy Arrangements." Innovation in Aging, vol. 2, no. 1, July 2017, pp. 1–8.

members to stay at home by providing internal financial resources. Thus, financial resources are the ultimate enabler of European families that allow enactment of cultural preferences. At the same time, individualistic societies that enable older adults to find care beyond the responsibilities of their adult children encourage greater levels of civic engagement.[62] These findings suggest that despite particular international models of intergenerational care, the families that cannot afford to take on these responsibilities might find an individualistic approach in which the state provides resources fuels a better, more productive society that does not neglect family values.

As cultures shift and begin to deviate from cross-generational models, perhaps we must advance past the historical model of tending to our relatives at home and instead provide them resources and attention to gain independence.

This assessment, as well as societal changes that come with the aging Boomer generation, have awoken a relatively new model of senior care which looks at creating cross-generational interactive spaces. The Madrid International Plan of Action on Aging focused heavily on the importance of developing new elements in senior care and living facilities, emphasizing the importance of redeveloping a 'society for all ages'.

> "A society for all ages, which was the theme for the 1999 International Year of Older Persons, contained four dimensions: individual lifelong development; multigenerational relationships; the interrelationship between population ageing and development; and the situation of older persons. The International

[62] (Dykstra 5)

Year helped to advance awareness, research and policy action worldwide, including efforts to integrate the issue of ageing in all sectors and foster opportunities integral to all phases of life."[63]

Symbiosis of Intergenerational Relationships

Intergenerational projects are a new model of built environment that explore and exploit the advantages to the symbiosis that exists between generations, particularly between the youngest and oldest. Before beginning to divulge the benefits of interaction between generations, it is helpful to understand the basics of different phases of life. Different generations and different phases of life face different challenges, emotional responses and experiences.

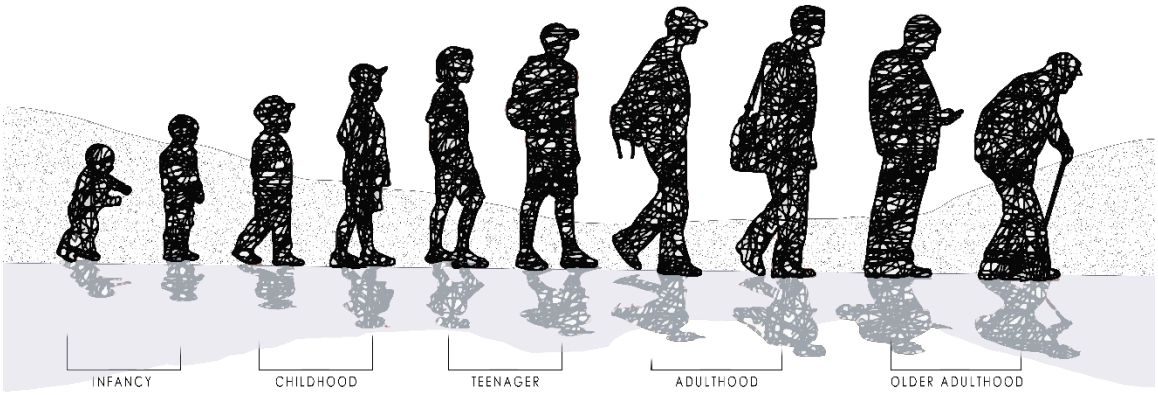

Figure 4-1: Phases of Life Experience Different Needs
(Image Source: author, inspired by Grace Donnelly of Fortune.com)

"Children love to play and learn, looking forward to becoming preteens. As preteens begin to test their independence, they are eager to become teenagers. Teenagers anticipate the promises and challenges of adulthood. Adults become focused on creating families, building careers, and experiencing the

[63] *Political Declaration and Madrid International Plan of Action on Aging*. United Nations, 2002.

world as an independent person. Finally, many adults look forward to old age as a wonderful time to enjoy life without as much pressure from work and family life. In old age, grandparenthood can provide many of the joys of parenthood without all the hard work that parenthood entails. As work responsibilities abate, old age may be a time to explore hobbies and activities that there was no time for earlier in life"[64].

Since the Madrid International Plan of Action on Aging, more research has been conducted on the relationship of seniors to younger generations, and the effects of interaction or cohabitation on loneliness. One study from 2012 looked at the effects of living arrangements in seniors and their perceived loneliness. This study analyzed cultures across Europe and Asia. Findings suggested that living alone does not equate loneliness- rather, older adults who live alone but maintain supportive networks, participate in rewarding activities, and or value independence and autonomy are not prone to loneliness.[65] In these situations, such as in Northern European countries, older adults perceive living with their adult children as a sense of defeat instead. However, living alone falls short of living with a partner or peer, which is the ultimately least likely to result in loneliness. This is to say that intergenerational cohabitation within the family, despite the financial or practical support, are more

[64] Little, William, and Ron McGivern. *Introduction to Sociology - 1st Canadian Edition*. 1st ed., OpenStax College, 2014.

[65] Gierveld, Jenny de Jong, et al. "Living Arrangements, Intergenerational Support Types and Older Adult Loneliness in Eastern and Western Europe." Demographic Research, vol. 27, Aug. 2012, pp. 167–200.

likely to experience loneliness than older adults who live alone, with peers, or a partner.

Nevertheless, frequent interaction with others often involves giving and receiving support, of which there are great benefits. The theory of altruism suggests that an act of giving is "respected and esteemed", and there is value in feeling important to others.[66]

"Older adults who are primarily on the giving side (among men and women aged 60-79) have the lowest levels of loneliness."[67]

A healthy balance of giving and receiving is most frequently healthiest. A balanced model of social support promotes health, a sense of self-worth, mental stability, and motivation to improve living situations.[68]

Figure 4-2: Benefits to Senior Citizens of Intergenerational Work and Interaction
(Image: author; Data Source: *Work in Retirement: Myths and Motivations* and Henkin et al.)

Giving as a senior often materializes in the relationship between grandparents and grandchildren. Elders who act as grandparents often fill roles to engage in one or

[66] (Gierveld et al. 172)
[67] (Gierveld et al. 183)
[68] (Gierveld et al. 172)

more of four functions: socializing, support, information and education, and symbolic activities.[69] Socializing can appear in face to face or virtual contact, and typically involves doing things and having fun together. Support comes in many ways, primarily emotional, instrumental or physical, and financial. Grandparents can be teachers, motivators, and mentors through their developmental and educational phases. They can enact symbolic routines and play a mentor role in transferring wisdom and traditions. Grandparents stand as "symbols of change" and transmit information, value, and continuity between generations.[70] These roles of grandparents towards grandchildren often come as a result of geographic distance or familial relations, but the benefits and interactions are a worthwhile investigation into how intergenerational interactions affect seniors and children.

Relationships between grandparent and grandchild evolve as the child ages. Where a bond may be far stronger in early childhood, prepubescent and preteenagers often feel distaste towards age and might separate themselves, whereas teenagers associate the grandparent with the adult world with reduced strength and power, and thus might feel less inclined to aggression or ambivalence as they might feel during parents. Meanwhile the grandparent are free to offer affective assurance without the underlying hint of intrusion.[71]

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[69] Szinovacz, Maximiliane E. Handbook on Grandparenthood. Greenwood Press, 1998.

[70] Pfeifer, Susan K., and Marvin B. Sussman. Families: Intergenerational and Generational Connectionss. Vol. 1, The Haworth Press, 1991.

[71] Smith, Peter K. The Psychology of Grandparenthood: An International Perspective. Routledge Taylor & Francis Group, 1991.

Psychodynamic models of research have analyzed the "fit" between the developmental needs of grandparents and their grandchildren, as well as the influence on a child's cognitive development based on their perception of grandparents.[72] One benefit from this relationship is the enhanced social solidarity.[73] As grandchildren age, they have become more familiar with age and how to associate with aging. This can begin to break the negative connotations behind aging, ones that build a foundation for ageism. Additionally, grandchildren can learn from and reflect on the identity of their grandparents and aim to age like them, or perhaps learn from their errors.

Older adults are excellent at filling the *compassionate teacher* role throughout a child's education due to their extensive learning experiences and developmental characteristics.[74] This remains true for teenagers and even young adults, particularly at a time of hardship or crisis. An older adult is well suited to provide assistance, insight, or simply companionship. In fact, several studies have been conducted on the effects of a mentor-mentee relationship between adults and young children, most involving at-risk students for the mentee population. Results from these studies show that when a child is mentored by an adult, their self esteem, social and emotional skills improve. In one study from 1995, after a period of 18 months in a mentor-mentee relationship, the children who participated in this study were 46% less likely to use illegal drugs, 27% less likely to begin drinking alcohol, and 52% less likely to

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[72] (Szinovacz 278)

[73] Bengston, Vern L., and W. Andrew Achenbaum. The Changing Contract Across Generations. Aldine de Gruytner, 1993.

[74] Newman, Sally, et al. INTERGENERATIONAL PROGRAMS: Past, Present, and Future. Routledge Taylor & Francis Group, 1997.

skip school.[75] Numerous other studies produced similar results, accounting for similar and additional benefits, such as improved relationships with their own family members, or a 30% decreased likelihood of starting physical altercations.[76]

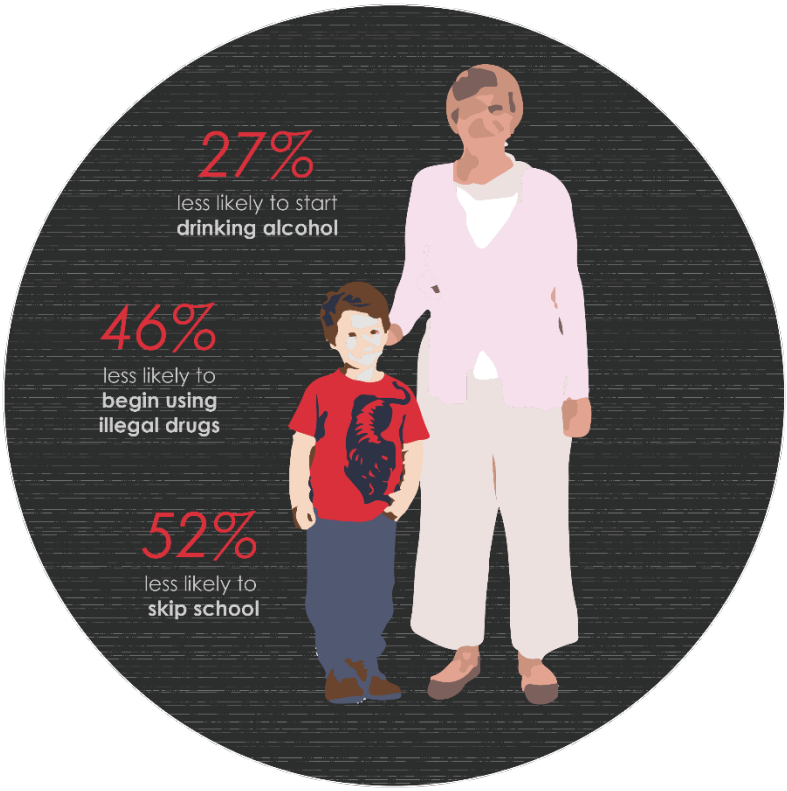

Figure 4-3: Impact of Relationship with Older Adult on Children
(Image: author; Data: Tierney et al.)

On the opposite end of the age spectrum, elders can benefit from firsthand and secondhand inclusion as a result of a close relationship with their grandchildren. Technology is a major barrier for seniors, but younger cohorts typically have a better understanding of technological advances which can be shared and taught to willing

[75] Tierney, Joseph P., et al. Making a Difference: An Impact Study of Big Brothers/Big Sisters. Evaluative, Nov. 1995.

[76] Wang, Victor C. X. Encyclopedia of E-Leadership, Counseling, and Training. Vol. 1, IGI Global, 2012.

grandparents. One study through a deprivation-compensation model found that adults actually enhance their mental health through a grandparent role.[77] The fact that grandparenthood is typically more of a choice than a demand allows the role to be filled in a freeform way. Grandparents can establish "demilitarized zones" and avoid intrusion into the lives of their grandchildren, holding their own children accountable for tackling certain topics that fall under the role of parent instead.[78] Acting as a grandparent also serves as "a vehicle for expansion of self and social identity" and that it "[fills] a need for creativity, accomplishment, and competence". It adds structure and stability to the lives of older adults, particularly in women, who are statistically take on a stronger grandparent role.[79] It offers adults a second chance at parenting, especially for men who historically fill the role of breadwinner and as a result spent less time with their own children.

These results mostly function under the assumption that these dynamics work best in situations where the grandparent is not the custodial grandparent. Custodial grandparents, or those who take on the function of primary parenting, most often find it difficult to bond with or establish a positive relationship between grandparent and grandchild.[80] It is worth noting that benefits of intergenerational relationships are most evocative in situations where there is not a direct lineage of care and responsibility between grandparent and grandchild but rather a secondary means.

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[77] (Pfeifer and Sussman 269)
[78] (Pfeifer and Sussman 271)
[79] (Pfeifer and Sussman 274)
[80] Hayslip, Jr., Bert, et al. "Custodial Grandparenting and the Impact of Grandchildren
With Problems on Role Satisfaction and Role Meaning." Journal of Gerontology: SOCIAL SCIENCES, vol. 53B, no. 3, 1998, pp. S164–73.

Many studies analyze the specific intergenerational structures within families, but the values extracted from these lessons possess implications for further studies into enhancement of intergenerational interaction, and these lessons underscore the symbiotic relationship between older and younger generations.

There have been a few new studies in senior housing centers exploring the benefits of intergenerational programs. A recent study in St. Monica's Trust in Bristol, U.K. has shown an immense impact on the physical and mental health of the seniors involved. By the study completion, 80% of the residents had improved grip strength and mobility, and 70% showed signs for reduced depression.[81] Though studies are just scraping the surface of how beneficial intergenerational interactions are for seniors, the results are overwhelmingly positive and constructive. Engagement in such programs can decrease social isolation and improve a sense of belonging, self esteem, and wellbeing of seniors. Intergenerational relationships can further address discrimination by ageism. Senior housing serves as an ideal platform to induce these interactions "given their nature… to provide economies of scale that help to ensure sustainability…[and] developing long-term partnerships with local educational institutions and youth-serving agencies can help expand social networks of adults, create meaningful civic engagements, and build social capital within the broader community."[82]

[81] (Usher)
[82] (Henkin et al.)

Spatial Qualities to Intergenerational Paradigm

The symbiosis of intergenerational interaction is supported by historical methods of living, methods that are still applicable in modern cultures in Eastern and less developed parts of the world. Author Kisho Kurokawa analyzes that "architecture acquires plurality through the inheritance of its historical tradition… The Japanese style of architecture called *Sukiya* employs a method in which historical forms are followed but new techniques and materials are introduced to produce gradual change."[83] We can analyze the benefits of intergenerational elements in international models of living and adapt these types of spaces to modern American society.

A major problem faced by senior living facilities is the stereotype that these homes are "warehouses" where "elders who created their children's prosperity should now be abandoned… as relics of an earlier era."[84] This stereotype questions how a senior living facility will affect not only the senior's health and wellbeing but also the strength of a familial connection. However, numerous studies have shown that quite the opposite is true- the "typological older person in industrialized societies is in close contact with kin, has warm relationships with them, and is both a giver and receiver of support and assistance."[85]

Designing a space that brings different groups of people together presents unique challenges with each pairing of groups. It is nearly impossible for two different groups of people to completely understand one another- each group possesses ineffable qualities and elements that remain sacred to that group.

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[83] (Kurokawa 27)
[84] (Bengston and Achenbaum 17)
[85] (Bengston and Achenbaum 17)

The key to a healthy symbiotic relationship encompasses two steps: creating **sacred zones** of each party respected by the opposing party, and including an **intermediate zone**, a shared space adaptable to accommodate the opposing groups.[86]

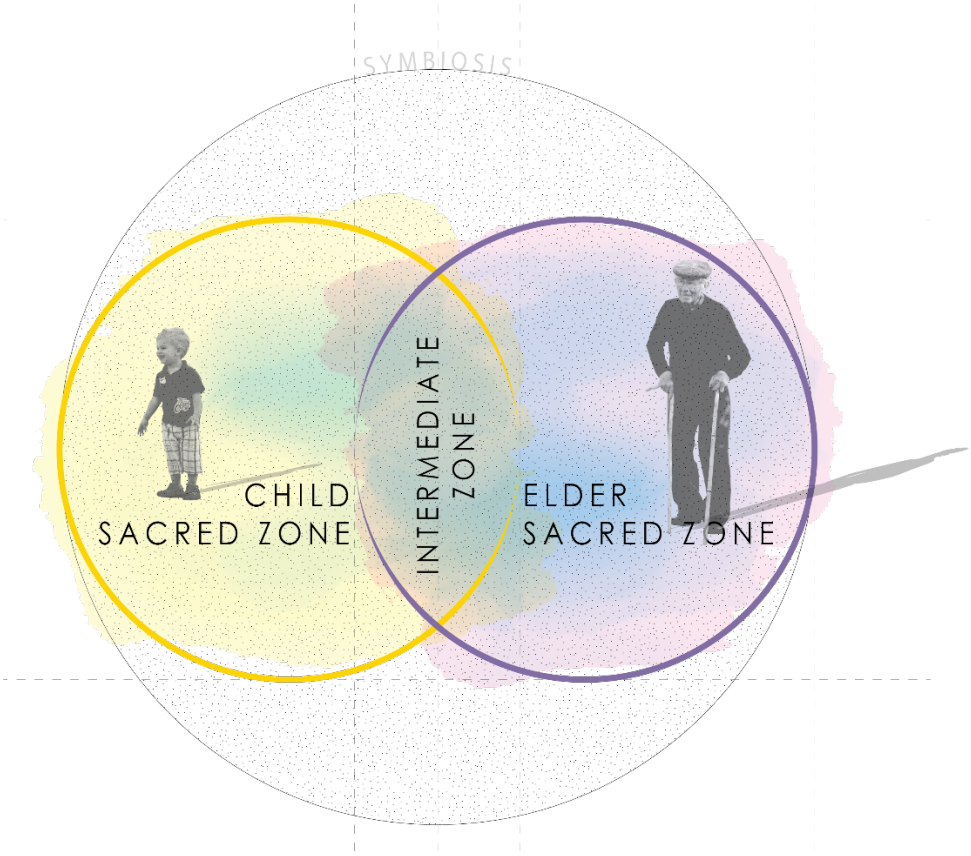

Figure 4-4: Symbiotic Relationship Dependent on Sacred Zones and Intermediate Zones
(Image: author; Data: Kurokawa)

The intermediate space is dynamic and vague as is its quality, use, and perhaps ownership is determined by the groups involved. When bringing different age groups together, each group must have a designated space that protects sacred values specific to that group. Intermediate spaces that do not solely belong to either party

[86] (Kurokawa 90)

can be fluidly incorporated throughout the design. This inclusionary system of design distinguishes cross cultural, or in this case cross generational, from dualistic.[87]

Sacred zones exist at multiple levels, particularly in the way of private living. European models of intergenerational living assess the difference between multi-generational families live together versus spend time together. **Benefit of spending time with other generations- detrimental to health when there becomes an interdependence from residing together**

Cross generational spaces should take advantage of exterior spaces. Anecdotal evidence and research indicate an overarching feeling of pleasure people of all ages experience in the outdoor environment.[88] This may relate to the symmetrical balance between manmade and the natural environment as well as a sense of familiarity this may induce. Children are more aware of balance and may not notice visual symmetry as much as adults, though symmetrical design is typically balanced. At the same time, auditory processing plays a role in comfort within an outdoor space. Outdoor spaces situated in a zone with the sound of high automobile traffic may be avoided.

Indoor spaces must consider scale in relation to the user. A child, for instance, may perceive a space filled with furniture or objects scaled to a child's size to be cavernous due to the discrepancy between scale of space versus scale of object, whereas an adult would feel the same room as normal sized with miniature furniture.[89]

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[87] (Kurokawa 86)
[88] Baird, John C., and Anthony D. Lutkus. Mind, Child, Architecture. University Press of New England, 1982.
[89] (Baird and Lutkus 106)

Planning studies were conducted across different youthful age groups involving mapping boards in which different 'programs' were to be placed, essentially designing the programmatic organization of a city or a building.[90] The results show that children and young adults tend to design spaces that cluster spaces or activities. These youthful minds categorized actions based on their own experience with them and spaced these groups in clusters across a board. Children and young adults build spatial assumptions and preferences based on their experiences. Similar activities belong together spatially, and spaces that evoke memories or familiarity induce comfort.

Some factors that contribute to feelings of loneliness in older adults include economic insecurity, deteriorating public health services, or political upheavals.[91] When designing spaces that aim to revitalize seniors and avoid creating loneliness, it is essential to consider the financial impact of living spaces and how they might cope in their age of retirement. Opportunities to receive quality health services, such as mentioned in Figure 2-1, is an essential quality to maintain social and psychological health. Political upheavals are the most difficult to challenge.

[90] (Baird and Lutkus 94)
[91] (Gierveld et al. 174)

Chapter 5: **ARCHITECTURE FROM A CHILD'S PERSPECTIVE**

Emotion and Cognition

Emotional development begins at the earliest stages of a child's life, starting as early as its first few weeks. Emotional development occurs simultaneous to development in motor skills, cognition, and communication. Basic ability to interact socially develops within the first five years of a child's life- these foundations of social interaction carry over in a child's life to his or her ability to adapt and function in a school setting and form relationships with their peers and advisors.[92]

The most crucial interactions that leave lasting impressions on a child occur with caregivers. Young children between the ages of 3 and 6 depend on "emerging capacities to interpret their own personal experiences and understand what others are doing and thinking", and thus during these years, a child is most vulnerable to their physical and emotional environment.[93] Studies of children at the elementary age compared different levels of coherence, and observed a child's familial relationships and how a more secure relationship with a mother figure in particular often lead to higher levels of coherence and security. In contrast, students with low levels of coherence happened to be the students that were considered hyperactive and aggressive by their teachers. Other studies observed that a child involved in a variety of activities in various environments is more independent and typically feels more enjoyment from social and leisure activities. These correlated with higher levels of sense of coherence. Even other studies noted that children with good relationships

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[92] Quehenberger, Viktoria, and Karl Krajic. The Handbook of Salutogenesis. Spring International Publishing, 2016.

[93] (Quehenberger and Krajic 109)

with teachers and peers report lower levels of loneliness. Loneliness, too, correlates with sense of coherence, and the greater involvement and stronger relationships increase this sense and reduce loneliness.

Through this research, this thesis proposes that children who develop strong and secure relationships with maternal or parental figures can develop stronger emotional control and cognitive coherence and can in turn become better students with manageable behavior. This thesis questions how architecture can promote a relationship, particularly for children who may not receive these opportunities in their home.

Spatial Perception through Childhood Development

> "One of the space functions in a pre-school premises, as a constructed and built physical environment in which a child spends time, is its contribution… to [a] child's abilities at a certain point of its development and its efficient interaction with the environment." [94]

The spaces and the environment children occupy play a primary role in the developmental phases of a child's life. Numerous neurophysiological studies have presented strong evidence that deprivation of experiences with specific stimulus properties can produce behavioral or anatomical losses.[95] Stimulating properties in the form of design can appear in sets of horizontal lines or vertical lines, for instance.

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[94] Stanković, Danica, and Jasmina Stojić. "PSYCHO - DEVELOPING NEEDS OF CHILDREN AND SPATIAL FEATURES FOR CHILDREN'S STAY." Facta Universitatis, vol. 5, no. 1, 2007, pp. 71–75.

[95] Baird, John C., and Anthony D. Lutkus. Mind, Child, Architecture. University Press of New England, 1982.

Additional studies from 1960 and 1973 have shown that children, particularly those studied in Beirut orphanages, had the capability of improved IQ scores from "enriched" and innovative learning experiences. Even while infants, minimal levels of visual stimulation have the ability to accelerate perceptual or motor development.[96] Colors and shapes can serve as easy sorts of visual stimulation for children. For instance, colorful cribs or cutouts in toys can serve to stimulate an infant.

The Vygotzki concept theorizes that efficient learning and development can only occur when a child is presented with challenges that are a bit above its current functioning level.[97] Problem solving, spatial perception, and attempts of communication can all occur from mindful spatial design and environmental interaction.

Exposure to the new allows a child to grow and reach new accomplishments. Design should consider the levels of perception that occur throughout a child's developmental years. Environmental interactions enable a child's abilities to achieve skills and overcome new challenges. In early years of development, a child achieves new milestones of perception at a rapid rate. From infancy, children can distinguish patterns showing linear discontinuity, and express stimulation by color and basic shape recognition.[98] Between the ages of 2 and 4, children begin to recognize object permanence and develop the ability to distinguish more meaningful and complex patterns. Between the ages of 4 and 5, children become aware of an object's distance from themselves, developing the ability to judge size based on proximity. Later,

[96] (Baird and Lutkus 6)
[97] (Stanković and Stojić 72)
[98] (Baird and Lutkus 8)

around the ages of 8 to 12, children develop a greater understanding of size judgments and perceptual constancy from a distance.

Children at their earliest phases are typically more “ego-centric”, as it takes several years of development before a child can imagine spatial perception from a position other than their own. However, studies of a child’s mapping abilities have shown that children develop spatial abilities at a rate more rapidly than previously assumed. Authors Siegel and White, along with several others, established a basic roadmap of developmental phases in a child’s mapping abilities. The first phase of understanding is recognition of important landmarks. Following this, children can identify primary routes that connect separate landmarks. Next is the ability to identify secondary routes between relevant elements in an environment. Once this basic understanding of spatial principles has been developed in a child, then comes the ability to recognize an overall spatial configuration, or the “gestalt”.[99] This sequence is depicted in Figure 5-1.

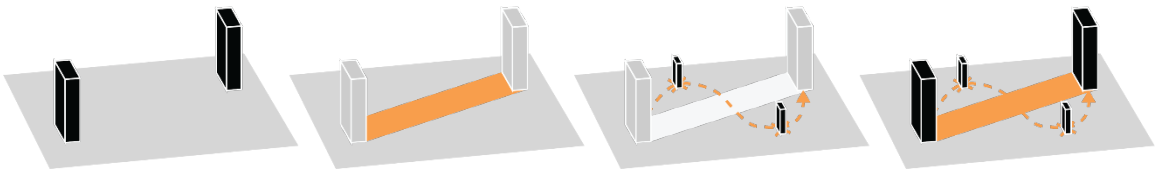

Figure 5-1: Development of Child's Spatial Mapping Abilities
(Image: author)

Understanding a child’s spatial perception can lead to a stronger design of spaces for child interaction that can promote healthier early development. Children need spaces that consider their abilities to maneuver and navigate. These attributes

[99] (Baird and Lutkus 11)

dictate the design of spaces ranging from dwelling to recreational, both inside and outside the home.

Developmental Necessity of Play

The concept of salutogenesis, a term coined by medical sociology professor Aaron Antonovsky, establishes a focus on supporting and promoting human health and wellbeing. This concept plays an essential role in designing healthy spaces, particularly for children. Spacemaking qualities that encourage playfulness, creativity, and mental and intellectual stimulation fall under this category of salutogenic architecture. Figure 5-2 depicts means of healthy design features that stimulate children and encourage playful interaction.

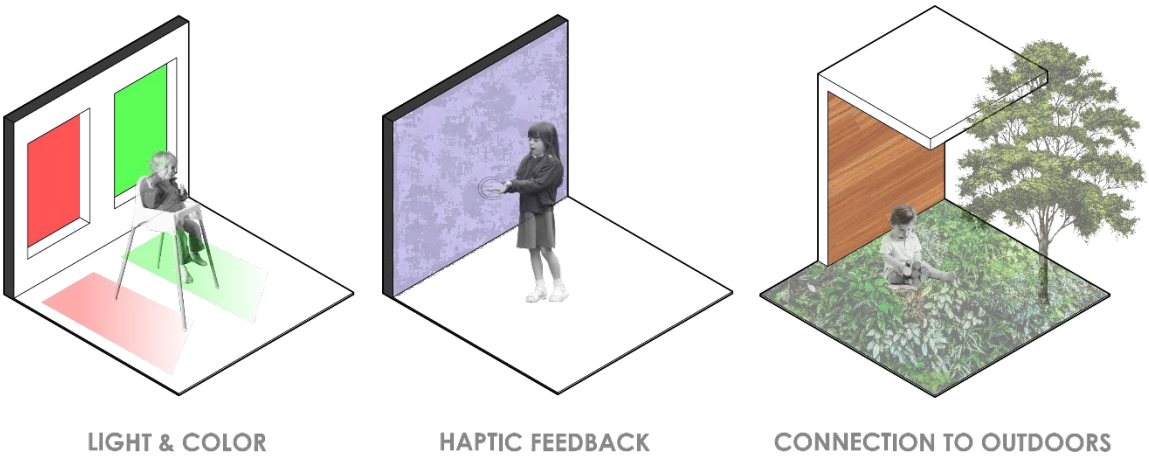

Figure 5-2: Healthy Elements for Spaces Designed for Children
(Image: author)

Throughout a child's physical and psychological growing process, they need a space to play to stimulate body and mind. Playing and offering the freedom of creative outlets stimulate and enhance a child's abilities. In design projects that deal with dwelling, finding a space to designate for this purpose can be a challenge. Reports show that children express an appreciation to a level of privacy and peace in

their play areas.[100] The difficulty to design play space often results in play areas being separated from a home, typically in a secluded location that requires some care and supervision by the surrounding community. This placement often fails to satisfy the needs of an active and safe social play area. Based on a discussion with children from Kemayoran multi-stories housing, despite the lack of safety, playing outdoors and in close proximity to home and the comfort of the familiar was preferred.[101] **To combat difficulty of creating play space within a community, perhaps community participation can become the catalyst to designing peaceful, safe, and comforting play spaces that encourage and enhance creativity and development**.

Minimize Spatial Boundaries

Children, like seniors, have specific spatial needs that must be studied prior to designing spaces for children. Parallels can be drawn between spatial requirements for children and seniors. Factors to consider are accessibility and safety. Children, much like seniors and older adults, can be vulnerable on their own. They might require physical assistance from caretakers, and they can likely face numerous boundaries in their daily activities. It is of the utmost importance that a space designed for children promotes safety, provokes creativity, and enforces comfortability and familiarity.

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[100] Kusuma, Nevine Rafa, et al. Community Engagement and Children Spatial Needs. 2017.

[101] (Kusuma et al. 674)

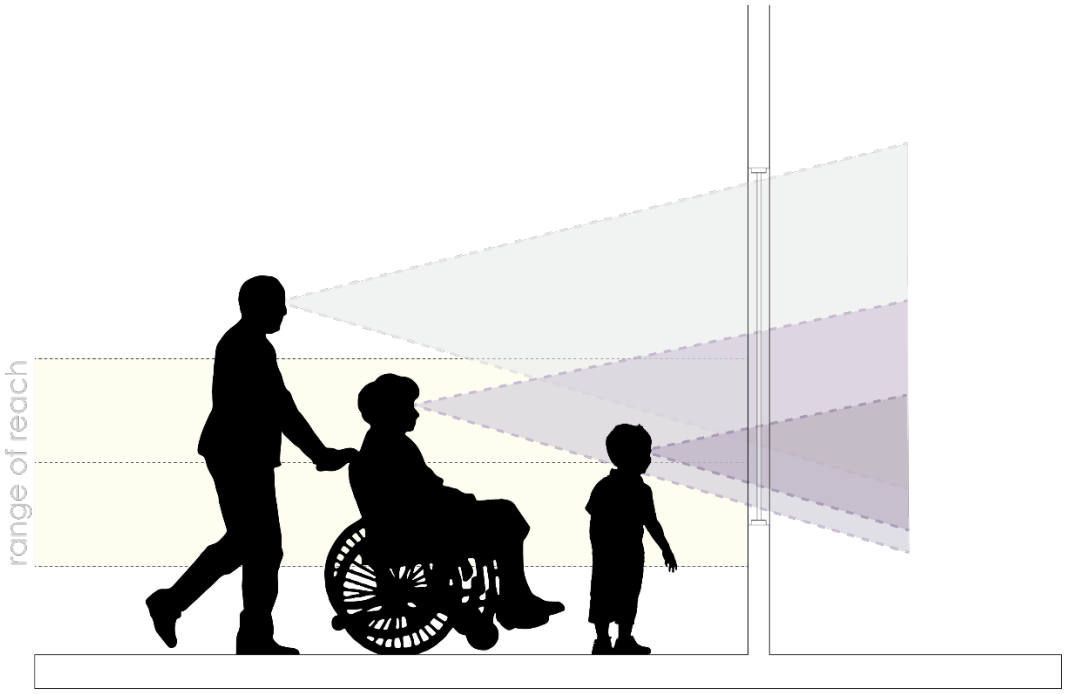

Figure 5-3: Line of Sight for Children Compared to Adults
(Image: author)

Figure 5-3 represents barriers that can be broken simply by considering line of sight and range of motion for children as well as adults. Spaces that address children consider limitations including visual, spatial, and comprehensible. Successful spatial construction of a child's environment should meet several standards, including but not limited to: safety, simplicity, availability, privacy, identity, and encouragement of creativity and stimulation.[102]

Can spaces be designed to minimize boundaries for children and instead serve as a developmental stimulant?

[102] (Stanković and Stojić 73)

Chapter 6: **HOW ARCHITECTURE ADDRESSES AGING**

Options for Senior Living

"While at-home community care is crucial, it cannot be the only option or solution. The demand for more residential aged care facilities, skilled nursing homes, assisted living, or similar congregate housing that are places where both accommodation and care services are delivered is increasing at a rapid rate and will undoubtedly continue to do so at least in the near term."[103]

The option of living at home is one that many seniors choose to rely on, but this thesis will focus on providing opportunities beyond this solution. As discussed in earlier chapters, this thesis assesses the mental, physical, and psychological health benefits of senior social living options. The primary options of senior living, varying in the level of care provided, include independent living, board and care, assisted living, memory care, skilled nursing, and life plan communities.

Independent Living

Independent living requires the least amount of assistance and care for the elder residents. Building typologies can include cottages, townhouses, or personal apartments and typically range from 1500 to 2000 square feet per unit. Residents in independent living have their own kitchen, living, and dining areas as they would have had in their home prior. They are provided with communal amenities, and in recent years food service has escalated to include finer and more diverse cuisines, cafés, and bars, according to senior living principal of Hord Coplan Macht, Cynthia Shonaiya, AIA[104].

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[103] Andershon, Jeffrey, et al. Design For Aging. John Wiley & Sons, 2012.
[104] Liao, Alice. “Getter Better with Age: Design for Senior and Assisted Living

Independent living is classified as R-2 residential use in the International Building Code (IBC), subjecting senior living to the same guidelines as multifamily housing and dormitories.

Assisted Living

Seniors living in assisted living require housing and mild assistance with daily activities. Less than the care provided at a nursing home, assisted living often allows residents the opportunity to live in private apartments with kitchenettes. These apartments can range in size from 320 to 650 square feet[105]. Meal services and housekeeping are routinely provided by onsite staff. Building typologies can range from urban apartment buildings to suburban complexes large or small. According to the definition by the senior care advising organization aPlaceforMom, assisted living houses at least 20 people but can vary up to hundreds of residents[106].

The IBC classifies assisted living as an Institutional building type, falling under I1 construction with two conditions: Condition 1 stipulates the ability for residents to evacuate without assistance, and Condition 2 mandates a high standard of construction and allows for minimal verbal and physical assistance by the residents[107].

Board and Care

Facilities." Architect, no. Dignity and Architecture.

[105] (Liao)

[106] *Guide to Senior Housing & Care US Edition*. aPlaceforMom, 2018,

[107] (Liao)

Also known as *Residential Care* homes, Board and Care options are the most similar lifestyle to living at home. Board and Care facilities are typically houses that have been transformed to host small groups (usually fewer than 6) of elder individuals that have more personalized caretakers. Requiring more assistance than assisted living, board and care senior living options involve more personal care and staff attention due to fewer residents. They are frequently found in the middle of a regular residential neighborhood.

Memory Care

Also referred to as *Alzheimer's Care, Dementia Care,* or *Alzheimer's Special Care Unit*, Memory Care serves an exponential growth in intensity of care. A person suffering from dementia will slowly lose independence and eventually require 24 hour care, meaning the environment must be highly secured and complete with highly trained caretakers. Activities and spaces are catered to specifically suit the needs of residents, ranging from assisted bathing to guiding through the hallways. Memory care is often subjected to uniquely rigorous guidelines.

Skilled Nursing

Skilled nursing facilities, otherwise known as nursing homes, are specifically designed for seniors in need of 24 hour care. Residents of nursing homes are often limited to their bed or by a wheelchair, often a result of debilitating physical or mental conditions that required daily assistance from skilled nurses. This is often the destination for seniors after a stay in an assisted living

facility. Nursing homes often include meal service and other amenities catered to the individual's abilities.

Nursing homes fall under the Institutional category such as Assisted living, but at the I-2 category, calling for noncombustible construction like in hospitals. Nursing homes were once designed to mimic hospital wings but are trending to open plan housing groups instead. Numerous design guidelines have improved conditions as well, calling for requirements such as independent toilet rooms and direct access to sources of daylight, as well as a general heightened focus on person-centered care and purposeful living[108].

Life Plan Communities

Life Plan communities are also called Care Retirement communities, and these typically include a full continuum of care within a singular development. These communities often occupy multiple acres across a campus setting, though newer developments can be found in urban settings. Modern seniors want to "be where the action is" and thus a "number of mixed use projects in a denser environment" are appearing, complete with retail below a senior living community, reducing the sensation of isolation[109]. The allowance of mixing senior living types is limited by region; some parts of the country will not allow for skilled nursing to occupy the same building as other forms of senior housing.

[108] (Liao)
[109] (Liao)

	INDEPENDENT LIVING COMMUNITIES	SENIOR APARTMENT BUILDINGS	ASSISTED LIVING COMMUNITIES	MEMORY CARE/ DEMENTIA CARE	RESIDENTIAL CARE HOMES	SKILLED NURSING	IN-HOME CARE	ADULT DAY SERVICES	RESPITE CARE
AVERAGE AGE	75	65	80	80	80	Varies	Varies	Varies	Varies
COST	$2,000-$5,000 per month	$400-$1,900 per month	$3,500-$10,412 per month	$3,500-$6,600 per month	$1,000-$8,000 per month	$6,000-$13,000 per month	$20-$39 per hour	$60-$215 per day	$90-$250 per day
MEALS PER DAY	Meal Plan Options	None	3+	3+	3+	3+	None	1+	1-3
MEDICATION MANAGEMENT	No*	No	Yes	Yes	Yes	Yes	Varies	Varies	Yes
DIABETES MANAGEMENT	No	No	Varies	Varies	Varies	Yes	Varies	No	Most Yes
INCONTINENCE CARE	No	No	Most Yes	Yes	Most Yes	Yes	Yes	Varies	Yes
PERSONAL CARE	No*	No	Yes	Yes	Yes	Yes	Yes	Varies	Yes
ALZHEIMER'S CARE	No	No	Varies	Yes	Varies	Varies	Yes	Yes	Varies
NURSES ON-SITE	No	No	Varies	Varies	Varies	Yes	Varies	Varies	Varies
MOBILITY ASSISTANCE	No	No	Most Yes	Yes	Most Yes	Yes	Yes	Yes	Most Yes
ACCEPTS WHEELCHAIRS	Varies	Varies	Most Yes	Yes	Most Yes	Yes	Yes	Yes	Most Yes
TRANSPORTATION	Yes	No	Yes	Yes	Varies	No	Varies	Varies	Varies
HOUSEKEEPING	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Most Yes
PERSONAL LAUNDRY	No	No	Yes	Yes	Yes	Yes	Yes	No	Most Yes

**Home Health Companies may be available to contract these services on-site.*

Figure 6-1: Analysis of Different Senior Care & Living Options
(Image source: aPlaceforMom)

All senior housing is mandated by a strict set of guidelines and codes. These codes include accessibility issues addressed in the American Disabilities Act (ADA), which dictate particular regulations such as those portrayed in Figure 3-7. The *Guidelines for the Design and Construction of Residential Health, Care, and Support Facilities* is published every four years by the Facility Guidelines Institute (FGI), and these educate on skilled nursing, nursing homes, and independent living[110]. In addition, building inspectors and fire officials follow guidelines from the International Building Code (IBC) written by the International Code Council and the

[110] (Liao)

Life Safety Code written by the National Fire Protection Association (NFPA), each of which are updated every three years.

Despite these strict guidelines, senior living design looks different throughout the world. Even within the United States, 40 states refer to the FGI guidelines to craft the base standards of design, and write the remaining balance independently, causing a lack of consistency in construction, materiality, and safety measures[111].

Precedent Analysis

The goal of this thesis is to design a healthy living environment that embraces the complications of aging while engaging and rejuvenating older bodies and minds. In order to understand how to create spaces that initiate these experiences, it is crucial to analyze the spatial sequences, circulation patterns, and three dimensional organization of existing precedents.

Various senior living facilities on the care level spectrum were studied. These studies looked closely at the arrangement of private and public spaces, as well the spatial sequence for the residents.

[111] (Liao)

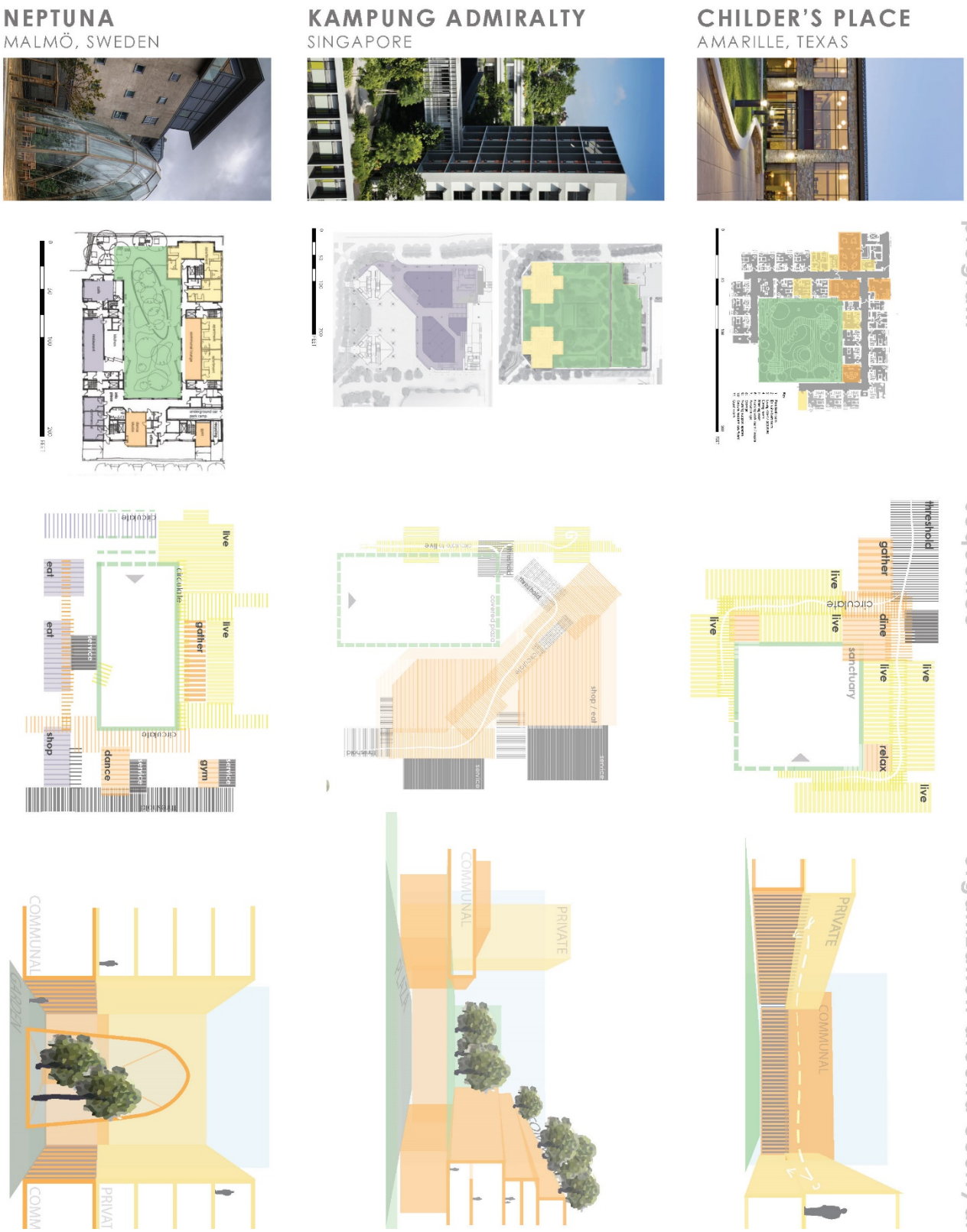

Figure 6-2: Precedent Studies of Senior Living Centers Around Courtyards
Image: author

The projects studied include nursing care in the Childer's Place, senior apartments with intergenerational and public facilities in Kampung Admiralty, and independent age-restricted living in Neptuna in Sweden. A common theme found in these examples is the circulation around a central courtyard. These senior living communities organize living spaces around communal spaces which encourage spontaneous and passive interactions.

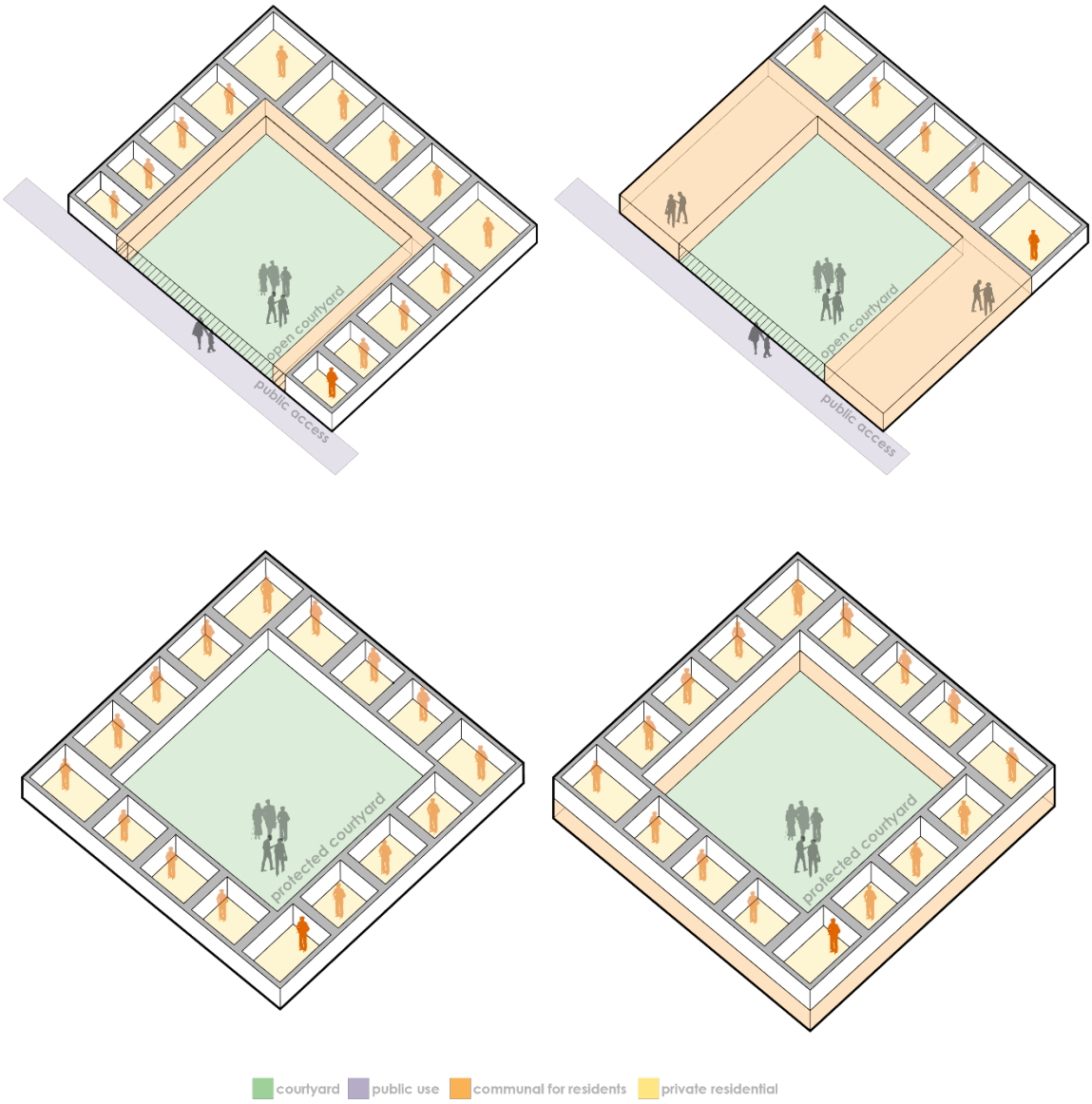

Figure 6-3: Courtyard Themes Seen in Senior Living Precedents
(Image source: author)

Additionally, these precedents redefine ambiguous and residual spaces such as corridors as opportunities for communication and engagement. Threshold sequences often serve as the semi-public segue between the private and public for the residents.

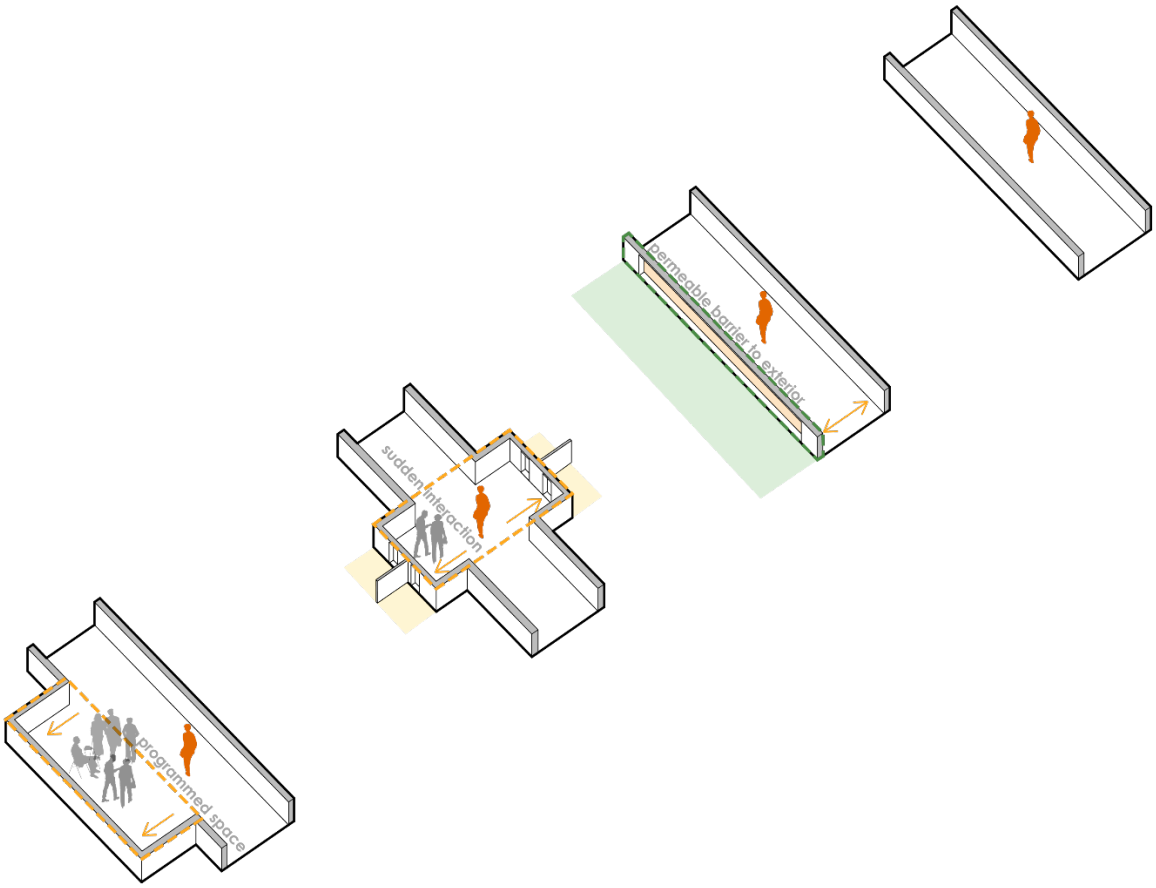

Figure 6-4: Designing the Ambiguous
(Image source: author)

The precedent analysis went beyond the scope of senior living and into different types of care and living facilities. Considering the intergenerational aspect that can be integrated to introduce a new paradigm of interaction for seniors, this thesis looked to a much younger age cohort, studying elementary and preschools. Designing a child friendly space in a building otherwise not typically designed for children will present unique challenges. In addition, young children face barriers similar to seniors, and spaces must be designed in a secure and safe way accordingly

that still allows the freedom to roam in a supervised manner. Spaces for children also promote spontaneity and often lack strict programming, which can become a design tool in creating flexible and passive spaces for seniors.

The precedents studied analyzed the way empty space was designed. In all three projects shown in Figure 6-5 have spaces within the overall enclosed space of the building. The circulation that results from these voids and solids of spaces allows for a great potential to creativity. For instance, in the Fuji Kindergarten in Japan, most of the rooms are open flexible spaces with maneuverable walls that can open to the central courtyard. Children can run around the vicinity, experiencing the indoors and outdoors both physically and visually.

These precedents also share a theme of relation to the natural environment. Children are encouraged to feel at one with nature through each project, whether it be indoors or outdoors. Compared to the Fuji Kindergarten and the Docet Institute which both open into protected courtyards, the KU64 Kid's Club in Berlin brings nature indoors. This project maneuvers the walls, ceilings, and floors in a pushing and pulling manner, turning the basic architectural elements into caves and inhabitable spaces. Some of these spaces, as shown in Figure 6-5, are occupied by greenery. While this project lacks the same visual connection to an outdoor courtyard, the Kid's Club brings those elements indoors and creates a calming atmosphere for the children and adult employees alike.

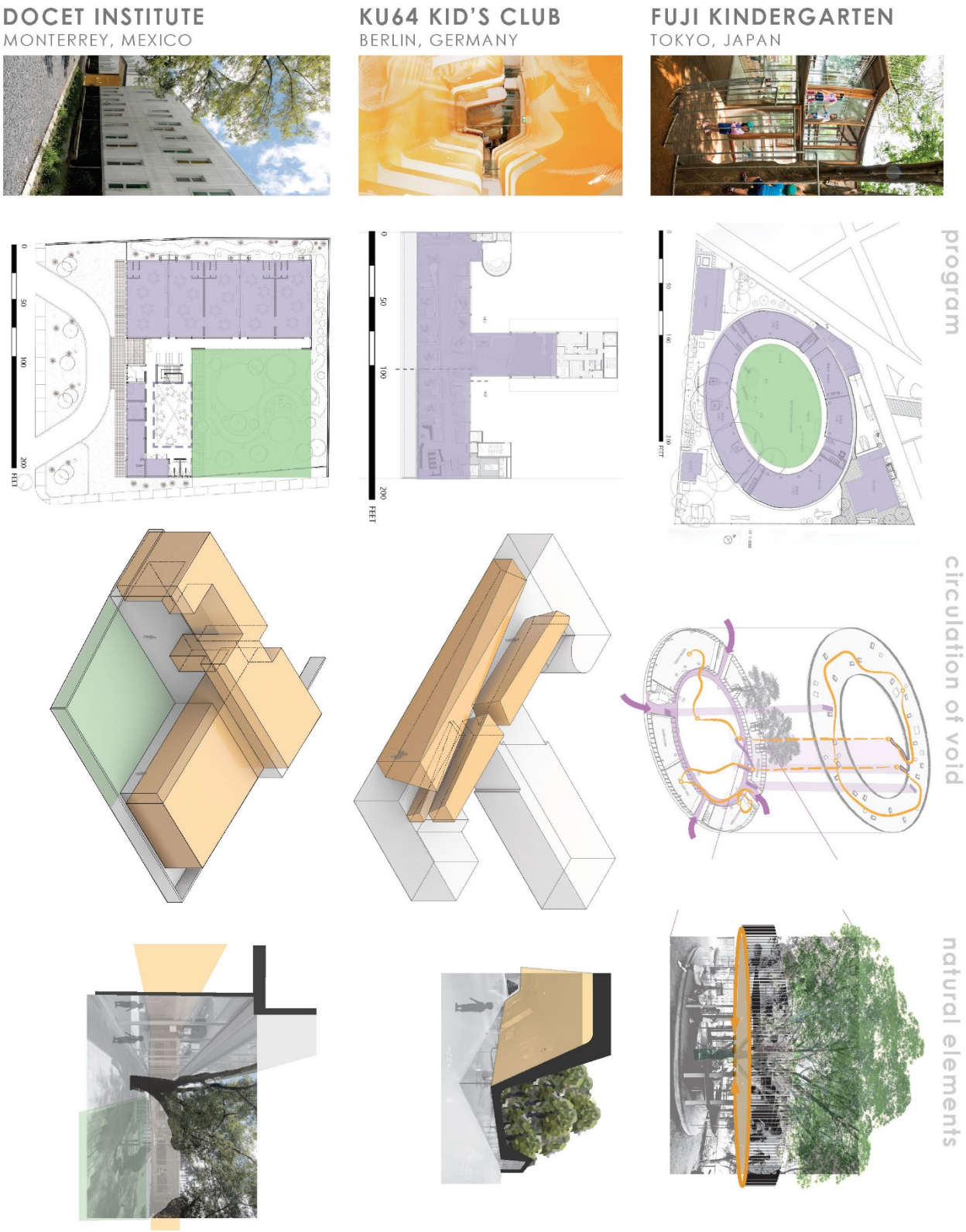

Figure 6-5: Precedent Studies of Designs for Children
(Image: author)

This thesis goes one step further in exploring other successful trends of design that encourage social interaction. College student housing can be considered a tool of influence for designing social dwelling spaces. Dormitory design influences social interactions both within and outside of the physical dormitory. A research program from 1977 showed that corridor style dorms often lead students to feel they have less control over social interaction in the vicinity of their rooms.[112] In comparison, students living in small suites feel they have more control over social interactions and create stronger relationships with their peers. This phenomenon extends beyond the dormitory- students living along corridors are likely to sit further from other in social situations, maintain less eye contact, and initiate fewer conversations. These students have even suggested they experience a sense of crowding and stress more than the students living in suites.

The concept of communal housing, particularly suite style with a balance of shared and private spaces, inspires other building typologies. This trend has emerged in senior living facilities across the US in the past ten years. The first communal housing projects have begun to take form, modeled after global precedents, particularly those found in Scandinavian countries.[113] Extracting design concepts from communal housing, much like that found in student housing, allowed for a deeper analysis of interactive spaces both active and passive. Student housing meets

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[112] Baird, John C., and Anthony D. Lutkus. Mind, Child, Architecture. University Press of New England, 1982.

[113]Glass, Anne P. "Lessons Learned From a New Elder Cohousing Community." Journal of Housing for the Elderly, vol. 27, no. 4, 2013, pp. 348–68, doi:10.1080/02763893.2013.813426.

similar needs of establishing independence while encouraging communal engagement. This living situation could feasibly be implemented as a means of encouraging social interaction amongst seniors. Additionally, shared living spaces can in fact reduce living costs.[114]

[114] Kaysen, Ronda. "Cohousing: A Growing Concept in Communal Living." AARP: Home & Family, 1 Feb. 2018.

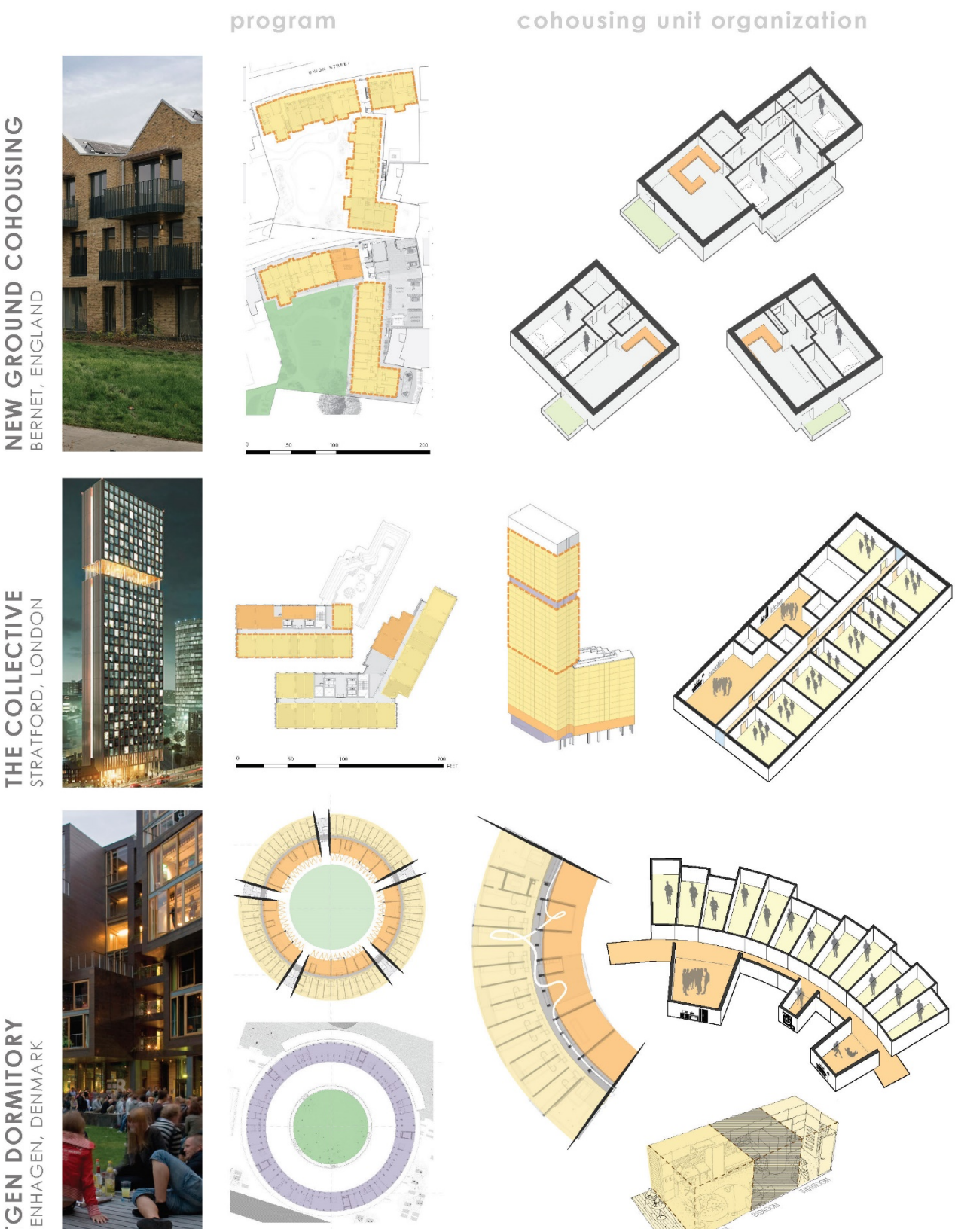

Figure 6-6: Precedent Studies of Cohousing Design and Social Unit Arrangement (Image: author)

The precedents analyzed in Figure 6-6 include a student housing project in Copenhagen, a communal living project proposed for Stratford, London, and a senior living project designed for women over the age of fifty in Bernet, England. All three display different organizations of spaces that are shared and private. The units vary in the amount of residents per room, though each cohousing example presents a certain level of sharing spaces between the various residents. For instance, the Tietgen dormitory has a kitchen and living room shared by 10 residents, whereas the New Ground Cohousing project in England provides each unit with a small kitchen, and instead several units share a communal amenity space.

Figure 6-7: Space-making Qualities of Salutogenic Architecture for Aging (Image: author)

Through this precedent assessment, these different typologies can be broken down into four core space-making characteristics: spontaneous interaction, outdoor connections, community integration, and secure independence. These qualities build up to conscious salutogenic architecture**.** A theory by Aaron Antonovsky provides a logic in how architecture can address health, aging, and healing.[115] Salutogenic architecture approaches design as a means of supporting health and wellbeing. When

[115] Quehenberger, Viktoria, and Karl Krajic. The Handbook of Salutogenesis. Spring International Publishing, 2016.

it comes to aging, the term "active aging" is often used to describe a healthier perception of growing older. The World Health Organization defines "active aging" as "the process of optimizing opportunities for health, participation, and security in order to enhance quality of life as people age."[116] Attention to salutogenesis improves the quality of a space, and this is particularly important in institutional and healthcare architecture, facets of design that have a direct implication on health.

Aged care in particular is the "largest section of long-term care", intended to support the lives of a vulnerable and often impaired cohort of people.[117] Conscious architecture can design spaces deliberately to encourage active aging. Spaces that promote daily interaction and social engagement will improve mental and psychological balance in an aging adult. Spaces for aging should provide a sense of independence and privacy while promoting engagement within the community and environment. This thesis aims to achieve these design goals to promote active aging and embrace a healthier lifestyle and outlook on aging.

Modern Shift to Urban Design

According to the World Health Organization, cities becoming "age-friendly" will transform cities in preparation for the aging demographic. A starting point lies in making environmental and social changes through design- for instance, providing greater means of accessibility, transportation, and access to healthcare

[116] World Health Organization. "Global Age-Friendly Cities Project." WORLD HEALTH ORGANIZATION, 2010.
[117] (Quehenberger and Krajic 325)

opportunities.[118] Though the older demographics are still occupying rural and suburban areas, "rapid urbanization" is changing the picture across the globe.

> Issue 3: "In many developing countries and countries with economies in transition, the ageing population is marked in rural areas, owing to the exodus of young adults. Older persons may be left behind without traditional family support and even without adequate financial resources… Older women in rural areas are particularly vulnerable economically, especially when their role is restricted to non-remunerated work for family upkeep and they are dependent on others for their support and survival. Older persons in rural areas in developed countries and countries with economies in transition often still lack basic services and have insufficient economic and community resources."[119]

An exodus towards the city involving all age groups is influencing older seniors to relocate as well. Several precedents studied are designed in cities that are focusing on becoming more age-friendly. In Singapore, for instance, the Kampung Admiralty is a senior living facility atop a major market place for shopping, retail, and food. The building itself has its own supermarket and is attached to a major transportation hub. These are just a few of the opportunities the urban setting provides.

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[118] (World Health Organization)

[119] *Political Declaration and Madrid International Plan of Action on Aging*. United Nations, 2002.

Figure 6-8: Community Standards Wheel: Design for Active Aging According to WHO
(Image: author; Source: (World Health Organization)

Cities offer opportunities for healthy and active aging as they can meet certain community standards. These standards organize into three categories shown in Figure 6-8: participation, health, and security. Integration into the city, creating opportunities to become involved in the community, allows for even the simplest of changes in physical or mental health. For instance, the flat urban landscape and walkability of a city encourage seniors to take a walk to a nearby grocery store, subtly promoting a healthier, more active lifestyle. Generally, simplicity remains most useful for comprehension of the space, and occasionally the limitations of an urban landscape can prove to lend itself to simple design. By tucking a senior living facility into the

urban fabric, residents are given the opportunity to feel visible, while design can maintain a sense of independence and privacy.[120]

A downside to the urban transition is the lack of natural environment that often results from hardscape. As this thesis explores urban design opportunities, natural environmental features must remain at the forefront of design. A pedestrian friendly community that promotes a healthy lifestyle offers garden space, as well as both shaded and unshaded areas, allowing the residents to receive sufficient Vitamin D.[121] Personalized outdoor and green spaces produce a sense of familiarity and comfort, though too much may become a burden to care for.

Additionally, long term care is frequently interpreted as an expensive option for senior living. The fear of expense is a major detriment to the success of senior care design. This thesis will challenge that stereotype through means of innovative urban architecture inspired by existing precedents.

[120] Thornton, Dean. "Challenging the Urban Aged Care Model." Sourceable: Architecture, 22 Aug. 2013.
[121] (Thornton)

Chapter 7: **DEFINING PROGRAM NEEDS**

Extraction of Program from Precedents

The precedents analyzed in Chapter 6: are categorized into three architectural typologies: typical senior living, children's facilities, and communal housing. Each type of architecture has its own unique elements that define important spatial qualities. Analyzing the salutogenic attributes of these three types establishes the basic foundational elements that can be combined for the purpose of this thesis. For instance, the elements of community and socialization that comes from communal housing can be considered when designing programmatic spaces for housing seniors. The most important qualities extracted from these precedent typologies are shown in Figure 7-1.

Figure 7-1: Essential Qualities of Each Precedent Typology that Embody Salutogenesis
(Image: author)

An example from each typology shows a greater level of detail to the programmatic spaces that define important spaces to meet each building's needs. Children's facilities have designated flexible spaces that can serve a variety of purposes through various means of ambulatory. Naturally, there are accompanying spaces that are designated for care, which may be less flexible and more specifically designed with technology or furniture. Communal housing provides spaces that are designated for living, which may also serve as a social function. There are typically also spaces designated solely for the purpose of social interaction. Finally, senior living buildings have a similar organization of living spaces in conjunction with

spaces that encourage interaction and engagement. This program breakdown of these precedents can be seen in Figure 7-2 and Figure 7-3.

precedent **program**

			QUANTITY	AREA (S.F.)	TOTAL AREA (S.F.)	NOTES
FUJI	flexible	OPEN CLASSROOM SPACE	4	2025	8100	
		OPEN CIRCULATION IN/OUT	4	218	872	
		UPPER LEVEL PLAYGROUND	*1*	*13796*	*13796*	
		INNER COURT PLAYGROUND	*1*	*7550*	*7550*	
	care	DAYCARE	1	1677	1677	
		ENGLISH ROOM	1	500	500	
		CAFETERIA	1	2040	2040	
		MAIN ENTRY	1	722	722	
		TOTAL			**35,257**	**TOTAL excludes circulation spaces**
		INTERIOR SPACES			13911	
		OUTDOOR SPACES			*21346*	
TIETGEN	live	**12 BED SUITES**	**30**	**7335** *(PER SUITE)*	**220050**	**TOTAL includes circulation spaces**
		UNIT A	3* *(PER SUITE)*	280	840 *(PER SUITE)*	*unknown- assuming 25% division of unit sizes
		UNIT B	3* *(PER SUITE)*	312	936 *(PER SUITE)*	*unknown- assuming 25% division of unit sizes
		UNIT C	3* *(PER SUITE)*	355	1065 *(PER SUITE)*	*unknown- assuming 25% division of unit sizes
		UNIT D	3* *(PER SUITE)*	452	1356 *(PER SUITE)*	*unknown- assuming 25% division of unit sizes
	&	COMMUNITY KITCHEN	1 *(PER SUITE)*	758		
		COMMUNITY LIVING	1 *(PER SUITE)*	415		
	interact	COMMUNITY LAUNDRY	1 *(PER SUITE)*	166		
		AMENITY SPACE	1	28100	28100	
		CENTRAL COURTYARD	*1*	*13885*	*13885*	
		TOTAL			**262,035**	
		INTERIOR SPACES			248150	
		OUTDOOR SPACES			*13885*	*excludes area of balconies*
CHILDER'S	live	**HOUSEHOLD**	**6**	**4082** *(PER HOUSE)*	**24492**	
		BEDROOM	10 *(PER HOUSE)*	316	3160 *(PER HOUSE)*	
		RESIDENT SPA	1 *(PER HOUSE)*	322		
	&	SHARED LIVING ROOM	1 *(PER HOUSE)*	300		
		STORAGE	1 *(PER HOUSE)*	150		
		QUIET ROOM	1 *(PER HOUSE)*	150		
	engage	DINING ROOM	3	565	1695	
		MEETING ROOM	3	810	2430	
		NURSING WORK ROOM	3	396	1188	
		COURTYARD	*3*	*6705*	*20115*	
		SUPPORT SPACES	3	145	435	
		TOTAL			**50,355**	**TOTAL only includes ground floor nursing care spaces**
		INTERIOR SPACES			30240	
		OUTDOOR SPACES			*20115*	
KAMPUNG	live	**STUDIO UNITS**	**104**		**43264**	
		UNIT A	52*	348	18096	*unknown- assuming 50% division of unit sizes
		UNIT B	52*	484	25168	*unknown- assuming 50% division of unit sizes
	engage	MEDICAL CENTRE	1	91500	91500	
		ELDERCARE & CHILDCARE	1	44000	44000	*unknown- assuming 50% size of Med Centre
		HAWKER CENTRE	1	10093	10093	
		COMMUNITY PLAZA	1	10764	10764	
		SUPERMARKET	1	10764	10764	
		COMMUNITY PARK	*1*	*22975*	*22975*	
		COMMUNITY FARM	*1*	*9285*	*9285*	
		VEHICLE / BIKE STORAGE	1	73086	73086	
		TOTAL			**315,731**	**some area unknown- list not exhaustive**
		INTERIOR SPACES			283471	
		OUTDOOR SPACES			*32260*	

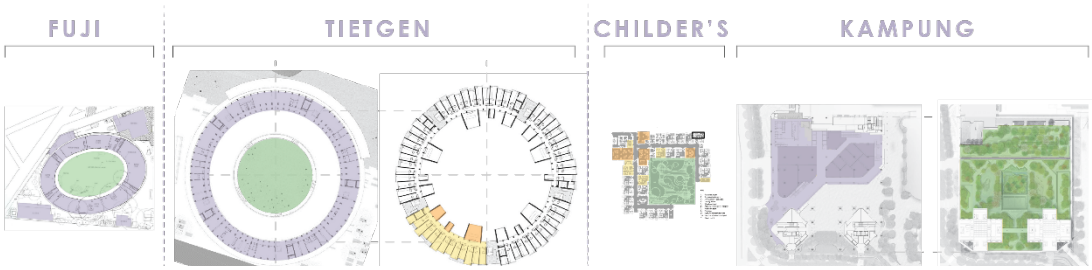

Figure 7-2: Compilation of Programmatic Spaces of Precedents of Various Typologies (Image: author)

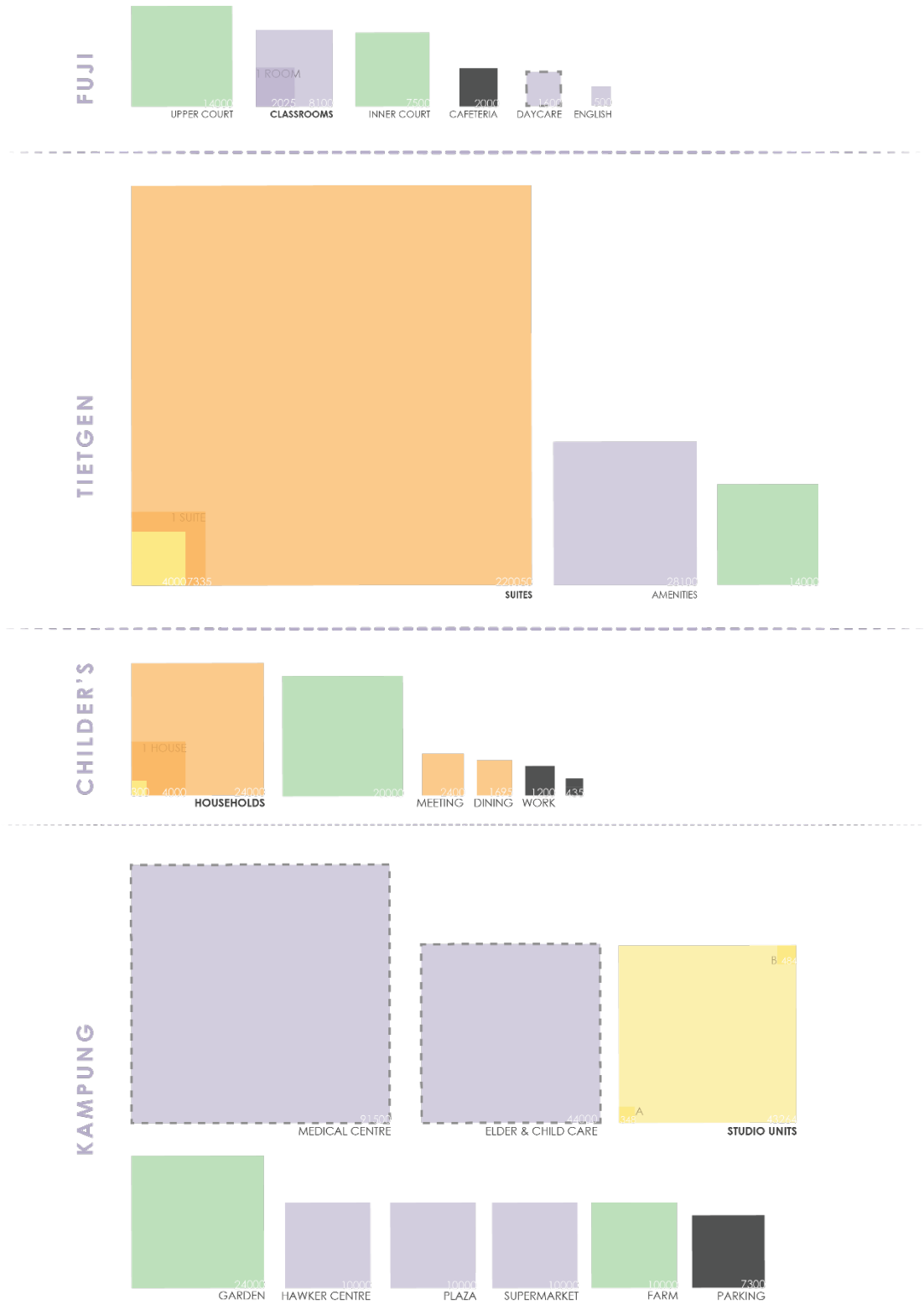

Figure 7-3: Visual of Program Spaces of Chosen Precedents of each Typology (Image: author)

The most essential programmatic elements from the architecture typologies studied can be categorized into three groups of purpose: engage, live, and care. Spaces of engagement can be flexible and serve a number of purposes and a variety of users. Engagement can be physical, intellectual, or social. Living spaces fulfill the essential role of security, privacy, and independence. Living spaces can also have a community aspect that encourage social interactions as seen in communal housing. Spaces designated for care can promote community as well, serving the role of care for children or adults in this new type of senior living and intergenerational care. Care spaces also cater to staff and caretakers as well as elements of care for the environment or building.

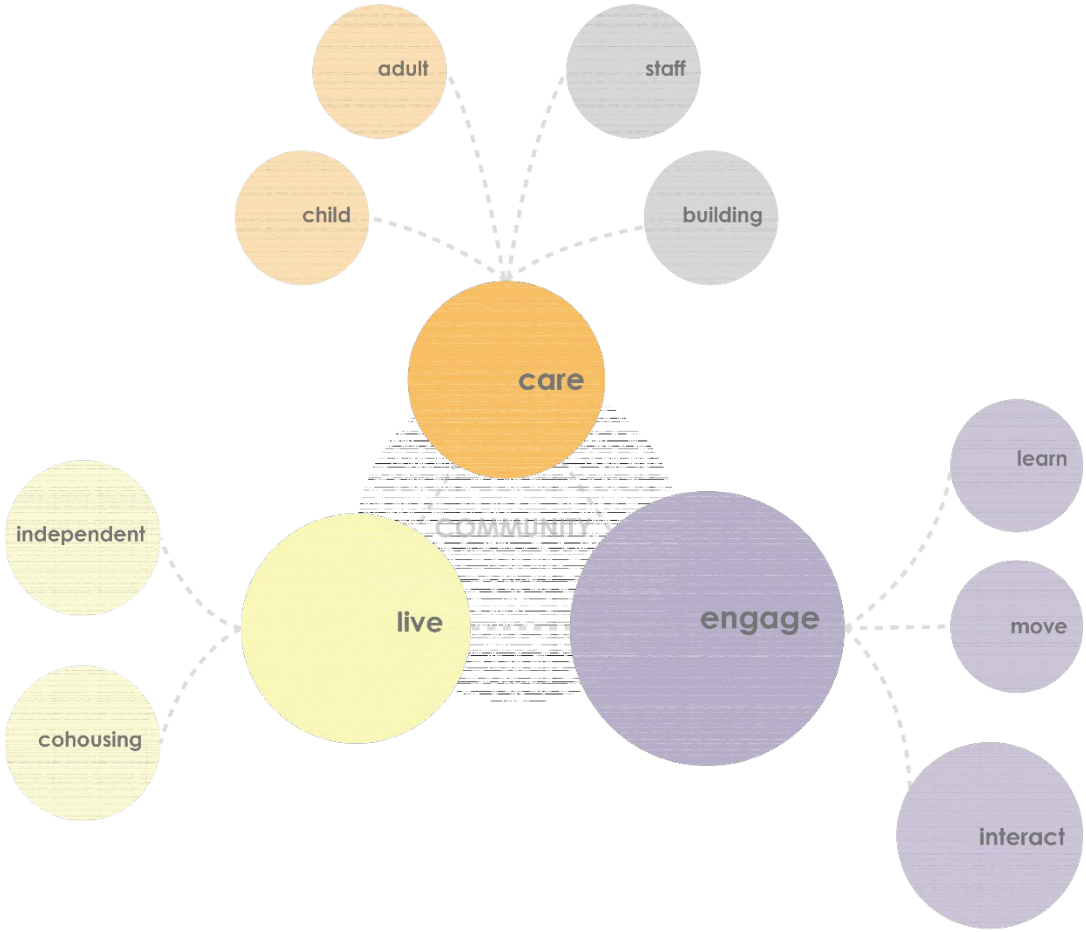

Figure 7-4: Programs Organized into Three Core Groups

(Image: author)

Using this grouping of programmatic spaces, as well as a more detailed list of spaces, a thorough list of important spaces, as well as their anticipated sizes, was compiled in Figure 7-5 and Figure 7-6. These spaces are comparable in size and program to the precedents studied and analyzed in Figure 7-3. The current proposed list accounts for approximately 4.5 acres in total area, which is something to consider when selecting sites. Ideally, this dimension will allow flexibility on the site and programs have room to grow or shrink from their proposed sizes.

Engaging

Engagement can be intellectual, physical, or social. Learning, exercising, or exploring new hobbies can give a newfound sense of purpose. Providing purpose can improve health and increase an individual's lifespan. In older generations, there is a greatest prevalence of women without jobs as a result of focusing on the home life, and thus upon entering senior years the chances of feeling a purpose are reduced. "Reduced participation in gainful employment contributes to a greater likelihood of late-life poverty among women."[122] Giving back a sense of purpose can improve the mental condition of an aging senior and serve as motivation daily. Activities engaging with children could serve as a means to apply such a purpose. Older individuals who obtain a sense of purpose "tend to be less reactive to stressors and more engaged" and this can "promote cognitive and physical health".[123] A former consultant and

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[122] Dykstra, Pearl A. "Cross-National Differences in Intergenerational Family Relations:
The Influence of Public Policy Arrangements." Innovation in Aging, vol. 2, no. 1, July 2017, pp. 1–8.

[123] Graham, Judith. "Seniors with Strong Sense of Purpose Often Live Stronger." Chicago Tribune, 7 Sept. 2017.

therapist, 75 year old Barry Dym embraces this phenomenon in his current lifestyle. After retiring, he felt he lost a sense of purpose and began to ask himself what gave his life meaning.

> "What gives meaning to me is helping people. Trying to have an impact. Working with people very closely and helping them become much better at what they do."[124]

Living

This thesis proposes two types of living situations. The program list includes traditional apartments that could serve independent or assisted living needs. It also includes cohousing living arrangements as seen in the communal housing studies. Matthias Hollwich of the architecture firm HWKN spoke at the World Architecture Festival in Berlin of 2016 on the issue of communal housing for seniors. Hollwich referred to current retirement communities and nursing homes as "storage devices" and believes cohousing, a "cross between student housing and hotels", could create happier and healthier aging communities.[125]

Caring

As observed in numerous senior living precedents, healthcare and therapeutic services can supplement the amenities offered to senior residents. Accessibility to healthcare and opportunities to enhance health and wellbeing are essential in creating a space that promotes active aging and salutogenic elements. Because this thesis considers combining senior care with childcare in one facility, spaces for childcare

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[124] (Graham)

[125] Frearson, Amy. "Co-Living Is Perfect to House Ageing Populations Says Matthias Hollwich." Dezeen, Nov. 2016.

are also included in the program list. Sacred spaces designated for children will be separate from those designated for the seniors. The category of caring also indicates essential support services.

preliminary **program**

			QUANTITY	AREA (S.F.)	TOTAL AREA (S.F.)	NOTES
ENGAGE	move	EXERCISE ROOM / GYM	1	1200	1200	
		DANCE STUDIO	1	1000	1000	
		FLEX CLASSROOMS (I.E. YOGA)	3	1000	3000	
		URBAN GARDEN	*1*	*5000*	*5000*	
	learn	SMALL CLASSROOMS	6	1200	7200	
		LARGE MULTIPURPOSE SPACE	1	4800	4800	
		MAKER SPACE	1	1500	1500	
		MUSIC ROOM	1	1500	1500	
		LIBRARY	1	2000	2000	
	interact	GAME ROOM	2	1200	2400	
		INTERGENERATIONAL PLAY SPACE	1	3000	3000	
		COMMUNITY CENTER	1	2000	2000	
		CONFERENCE ROOM	2	400	800	
		BUSINESS CENTER	1	400	400	
		CAFE	2	500	1000	
		FOOD HALL	1	6000	6000	
		ATTACHED RETAIL	6	1000	6000	
		COMMUNITY COURT	*2*	*5000*	*10000*	
		TOTAL			**58,800**	
		INTERIOR SPACES			43800	
		OUTDOOR SPACES			*15000*	
LIVE	cohousing	**6 BED SUITES (75% ACCESSIBLE)**	**10**	**3150**	**31500**	
		1 BED FULL BATH BEDROOM		450		
		SHARED KITCHEN		1100		
		SHARED LIVING ROOM		1100		
		SHARED LAUNDRY		500		
	independent	**ONE BEDROOM UNITS (ACCESSIBLE)**	**40**	**600**	**24000**	
		BEDROOM (ADA)				
		BATHROOM (ADA)				
		KITCHEN (ADA)				
		LIVING ROOM				
		CLOSET / W/D				
		TOTAL			**55,500**	
CARE	adult	**MEDICAL CENTER**	**1**		**1800**	*inc. staff area, exc. circulation/service
		EXAMINATION ROOMS	10	100	1000	should include surgery/outpatient?
		WAIT ROOM	1	200	400	
		THERAPY	4	300	1200	
	child	**CHILD DAYCARE**	**1**		**7850**	*inc. staff office area, exc. circulation/service
		PLAY SPACE	4	750	3000	assumes ~40 children
		CLASSROOMS	10	300	3000	
		RESTING ROOM	4	300	1200	
		CAFETERIA / KITCHEN	1	250	250	
		BATHROOM / CHANGING ROOMS	4	100	400	
		PLAYGROUND	*2*	*3000*	*6000*	
	staff	**OFFICES**	**8**		**800**	
		INSTRUCTORS	2	100	200	
		MEDICAL STAFF	4	100	400	
		DAYCARE STAFF	2	100	200	
		ADMINISTRATIVE	8	150	1200	
	building	ENTRY / RECEPTION	1	200	200	
		MAIL ROOM	1	150	150	
		PUBLIC RESTROOMS	4	75	300	
		STORAGE	4	200	800	classrooms, exercise, community, daycare
		MECHANICAL	1	3000	3000	
		LOADING / DRIVEWAY	*1*	*4800*	*4800*	
		TOTAL			**18,550**	
		INTERIOR SPACES			16700	
		OUTDOOR SPACES			*10800*	
		TOTAL GROSS AREA			**132,850**	all areas subject to change
		INTERIOR SPACES			116000	
		OUTDOOR SPACES			*25800*	

Figure 7-5: Proposed Program List for Thesis Design
(Image: author)

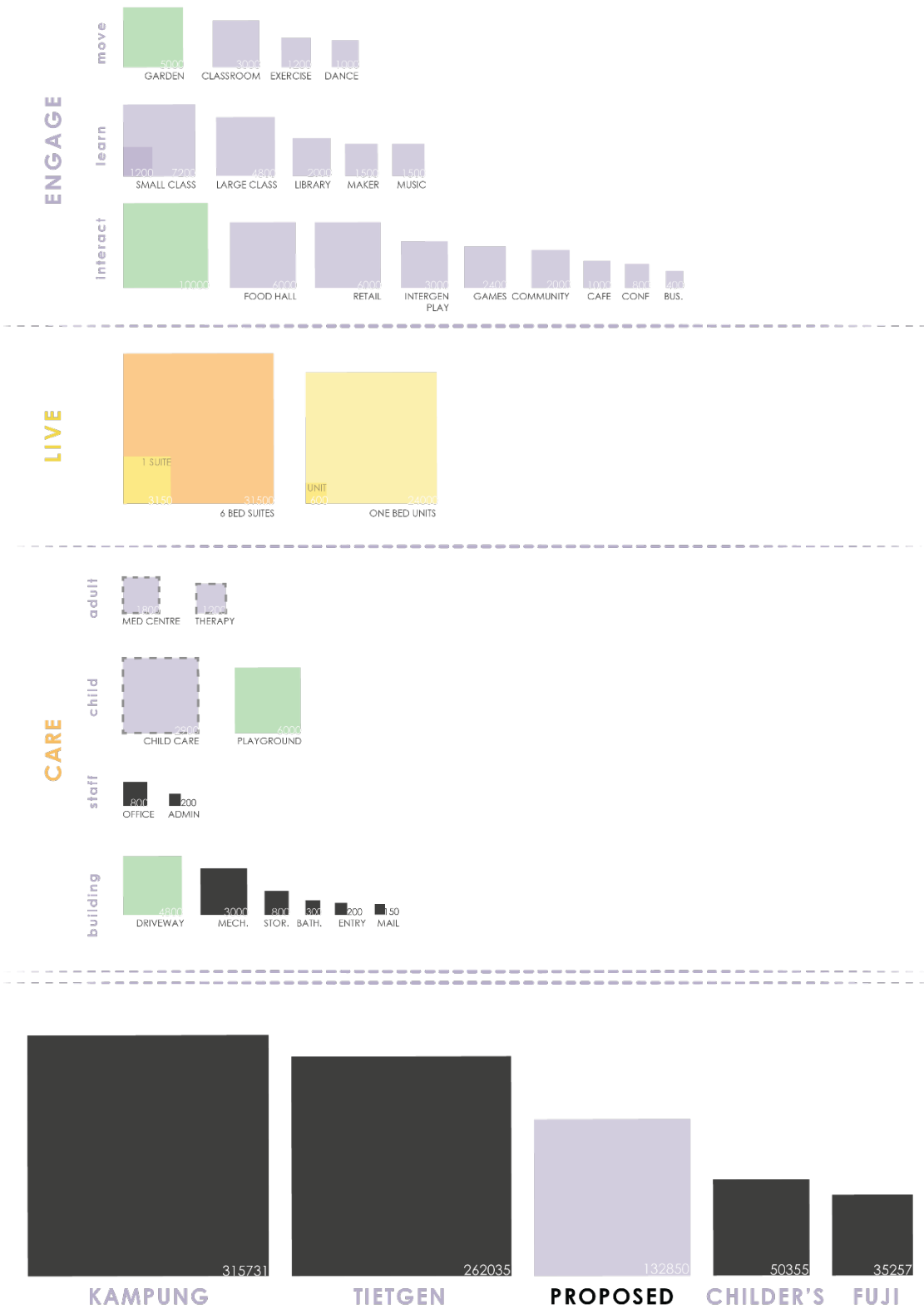

Figure 7-6: Proposed Program Blocks Based on Precedent Studies
(Image: author)

Chapter 8: **SITE SELECTION & ANALYSIS**

Designing Beyond Isolation

Isolation plays a major role in social and mental deterioration in older age. The environment of a home can changes the process of aging, thus choosing a destination determines the course an older life will take. Accessibility, both in terms of the ability to move independently as well as access to nearby necessities, is the biggest factor in the selection process of environment for the senior living center of this thesis.

As seen in newer trends in global precedents, senior living is beginning the shift towards urban environments. Similar to millennials, seniors require ease of accessibility and the opportunity to uphold an independent lifestyle. Urban environments provide the opportunity of ease of access around the environment, as well as nearby amenities to serve everyday needs.

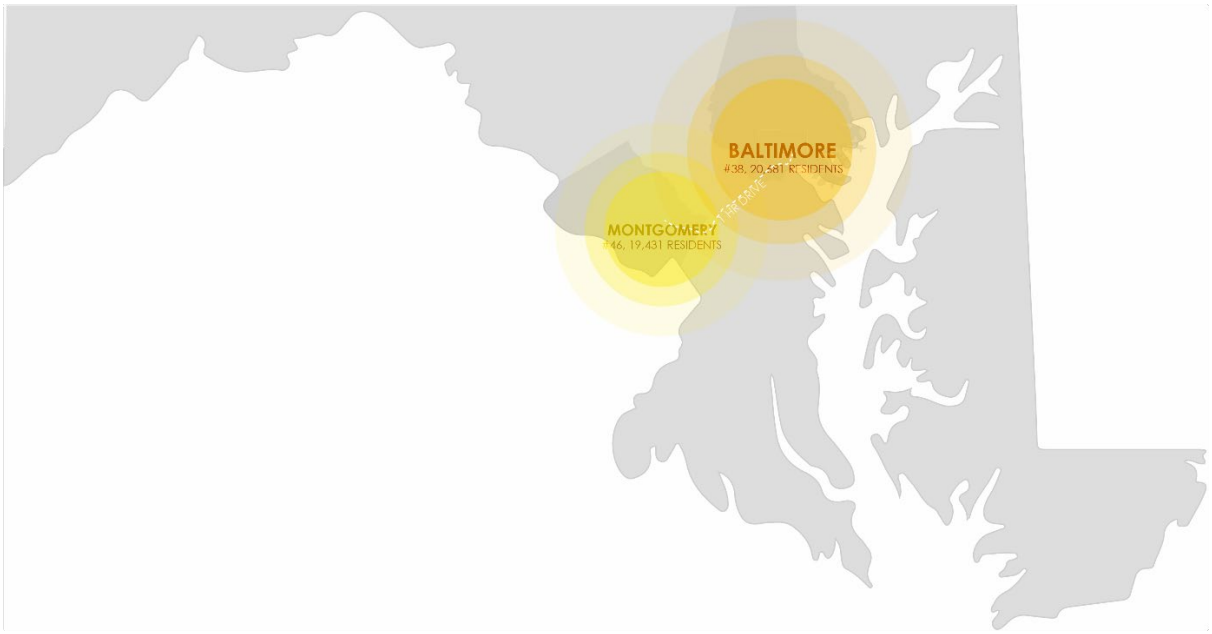

Figure 8-1: Highest Populations of Seniors (Aged 85+) Nationwide, Ranked by County

(Source: Author, Data: 2010 Census)

This thesis observed local communities located within the Delaware, Maryland, and Virginia region. As shown in Figure 8-1, Baltimore ranks number 38 in the top 50 counties across the nation with the highest senior populations aged 85 and older. Nearby Montgomery County also falls in that list at number 46. With the average age of 82 years being the point at which most people transition to aging care facilities, a city that serves both counties would hold high demand in the elder housing market[126].

Baltimore city possesses great potential for development and rebirth. East Baltimore in particular has been an icon for the city's growth and development. As of May of 2018, journalist for The Baltimore Sun, Dan Rodricks, described the "shock value" of driving through East Baltimore, describing "one block as dreary and abandoned" directly next to one "loved and restored"[127]. This comes just three years after an article by journalist Elizabeth Evitts Dickinson, in which she described the city still facing the ripple effect from the 1968 riots following the assassination of Dr. Martin Luther King, Jr.[128] Following these riots, the city zoning laws changed and in turn created a more hostile urban environment, eliminating commercial or retail from residential zones, bricking over ground level windows, and reducing public facing entries to private defense mechanisms. As buildings turned inwards and turned their backs to the streets, defensive urban architecture became the presence of the city.

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[126] Liao, Alice. "Getter Better with Age: Design for Senior and Assisted Living Facilities." Architect, no. Dignity and Architecture.

[127] Rodricks, Dan. "Shocking Developments in East Baltimore." The Baltimore Sun, May 2018.

[128] Evitts Dickinson, Elizabeth. "Architect's Role in Baltimore." Architect, no. Urban Design, May 2015.

Within the past decade, Baltimore has been determined to find its "civic compass"[129]. There are guidelines on how to design with minimal displacement, and efforts are being made to equalize gaps in gender, race, age, and class. Architecture is the written expression of those values and efforts.

Baltimore Senior Living

Baltimore has a long list of amenities that exist to serve the residents of the city from all ages, and currently hosts a number of senior living opportunities throughout the city, ranging in location and type of senior living. These options, shown in Figure 8-13 indicated by yellow dots, are numerous and varied in type including apartment living, independent living, assisted living, nursing homes, memory care, home care, and respite care.[130]

Before proposing a new design, the design of some existing senior centers in the city must be analyzed to observe the need of emerging innovative ideas in this city. One example is the well-located Christ Church Harbor Apartments, a building that is located along Light Street which borders the Inner Harbor. Images of the exterior view, as well as potential views from inside apartments, are shown in

[129] (Evitts Dickinson)
[130] "Senior Housing Types near Baltimore, MD." APlaceforMom.

Figure 8-2. This apartment complex has compelling views from a convenient waterfront location. According to the website of the facility, it serves seniors of a moderate income level, at which an individual must make around $50,000 or below, or a couple makes $57,550 or less. This complex aims to specifically serve seniors of a particular income level, though the design of the facility does little to provide more than the basic needs of a typical senior living facility. Whether it be lack of funding

or lack of inspiration, the design includes one multi-purpose space on the ground floor for social functions, and the apartment units allow for a maximum of two people to share a space. While the location is fantastic, the design is lackluster in the opportunities it provides for social and recreational activities. Additionally, the building serves no one other than the seniors who reside here and any potential visitors.

Figure 8-2: Christ Church Harbor Apartments with Views to Harbor or Neighboring Courtyard
(Image source: www.cchaseniorhousing.org)

Another affordable option that exists in Baltimore is the St. James Terrace Apartments, located on Arlington Avenue in Harlem Park. Unlike the Christ Church Harbor Apartments, the St. James Terrace Apartments are unfortunately in a neighborhood that has seen a great deal of turmoil and neglect. Harlem Park is on the

bottom of the housing market typology due to high crime and immense vacancy rates. The apartment complex itself is a rather old building, claiming to be one of the first senior living communities of Baltimore City. The living options include studios and one-bedroom apartments. Additional amenities include a lounge in the lobby, a community room, and a wellness suite. It offers the neighboring Lafayette Park as a viewpoint, though the remainder of its surroundings embodies the poverty of the neighborhood.

The interior images of the units represent the age of the building. These images are used on advertising websites on which adults may go searching for senior living options. The apartments are defined as accessible, though the image showing the kitchen in Figure 8-3 displays a rather tight fit into a corner. Additionally, the furniture and finishings are from the earliest days of this building's design and can give off an impression of an institution. While this building serves to cater to low income residents, lack of funding and lack of maintenance have forced this senior living facility to grow dated and lack the necessary spaces to establish social interactions successfully. Additionally, Harlem Park is a food desert that is rather disconnected from the city, and although the apartment complex houses on-site parking, a majority of the seniors may not be capable of driving a car and will rely on public transportation. This location will not allow the freedom due to lack of transportation, accessibility, and few necessities.

Figure 8-3: St. James Terrace Apartments of Harlem Park, Baltimore

(Images source: www.after55.com)

These living options provide the necessities that are expected and required of senior living, and often meet the standards of senior living architecture. Since the late 1990's senior living has been on an upward trend of deinstitutionalizing and redirecting the focus on the independent needs of the individuals rather than the

institution, giving back agency to both the caretakers and the seniors in these facilities[131]. The existing examples of Baltimore city often fall behind on this trend, though particular goals such as affordability and residential views, can serve as inspiration during the design phases. This thesis aims to look beyond the current standards and question the limits of what senior living could become.

Community Gateway

This thesis looks to create a senior living that serves as a multifaceted community gateway. Senior living is just beginning to explore the world of intergenerational interaction and relationships. Through design and urban integration, senior living can become more than just a means of living at the end of your life. Senior living can serve as means of connecting different age cohorts, uniting different communities in a communal space and providing care in other ways.

As a city that has historically struggled with poverty. Baltimore faces a great need in improved childcare and educational facilities for children. In 2013, 14 percent of the children in the state of Maryland lived in poverty, a jump from the 10 percent impoverished from a study in 2008.[132] Furthermore, 45.2% of children in the state qualified for the Free and Reduced Meals Program during the school year of 2014-2015, meaning the household income was at or below 185% of the Federal Poverty Line.[133] This number jumps up to 84.2% of children in Baltimore city alone. For the

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[131] (Liao)

[132] McDaniels, Andrea K., and Talia Richman. "More Children in Poverty than During the Recesssion, Report Says." The Baltimore Sun, 21 July 2015, https://www.baltimoresun.com/health/bs-hs-kids-count-20150721-story.html.

[133] Roberson, Camilla, and Lisa Klingenmaier. 2016 Maryland Poverty Profiles. Maryland Alliance for the Poor, 2016,

city of Baltimore, the 2016 Maryland Poverty Profiles found that 34.6% of children lived below the poverty line.

Statistics easily report on the difficulty of poverty that thousands of people and children and families face in Baltimore city. A constant issue for impoverished families with children, particularly families that consist of one parent, is child care. Families with two children who make the median income in the city spend an average of 29% of their income on childcare a year.[134] Unfortunately, for many families who make less than the median income will spend even less, and this in turn impacts a child's access to education and healthcare. As discussed in Chapter 5:, a lack of education and developmental stimulus or attention to wellness will generate a detriment to developmental abilities, relationship building skills, and behavioral management. A general guideline of these impacts are shown in Figure 8-4.

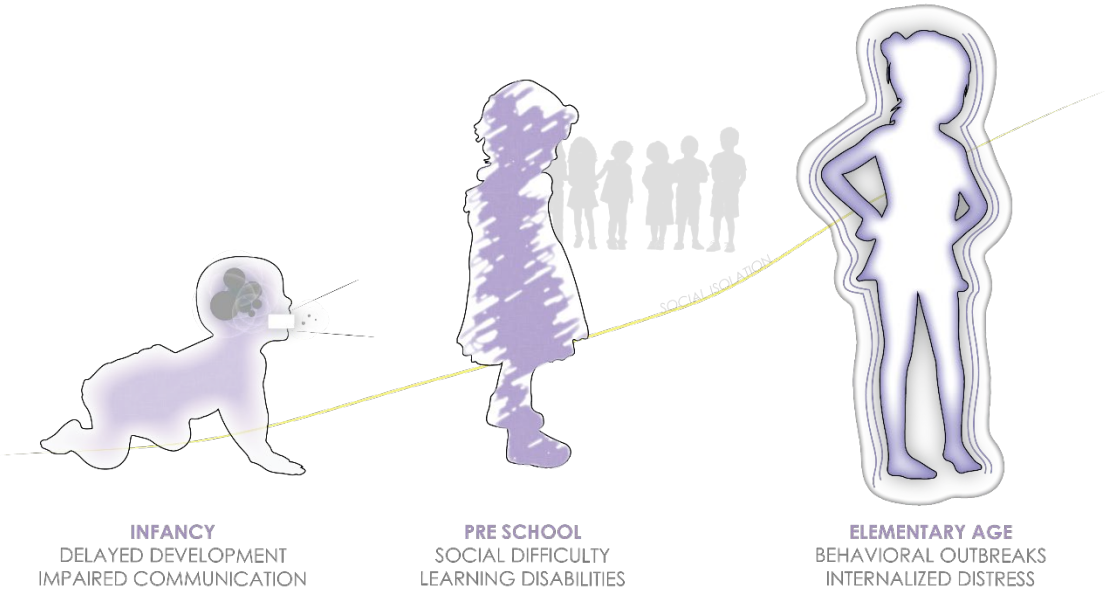


Figure 8-4: Impact of Poverty on Development of Child
(Image: author, Source: (Huston)

[134] (Roberson and Klingenmaier 9)

Laverne Woods, a single mother of Baltimore, can serve as a face to exemplify the difficulty an individual living the lifestyle faces on a daily basis. Woods earns a modest $9.50 an hour caring for elderly at an adult day care, but she maintains a hectic schedule that rarely fills a full 40 hours a week.[135] Her biggest concern is caring for her 10 year old son. Woods regrets to ever leave at home alone and is constantly in a grind to work enough to make ends meet. Woods claims, "I have to split my checks up… I am living from check to check." Reporters suggest that Maryland and Baltimore suffer more than other places in the country because of federal jobs and contracts, leaving smaller employees and businesses to struggle financially.[136] Naturally, Marylanders hope to diversify the economy and stray from federal spending, hopefully putting some money into the pockets of residents like Laverne Woods.

As it exists currently, the current economy creates a lack of money for many citizens, which then results in a lack of access to education. Naturally, a strong or complete education only improves chances of success, and thus children who suffer from poverty and lack of education can unfortunately perpetuate the existence of this cycle strictly by circumstance. Through a design that proposes alternative solutions to educating the youth and providing another source of creativity, learning, and relationship building, this thesis proposes the possibility of remediating the complex difficulties of the state's economy.

[135] (McDaniels and Richman)
[136] (McDaniels and Richman)

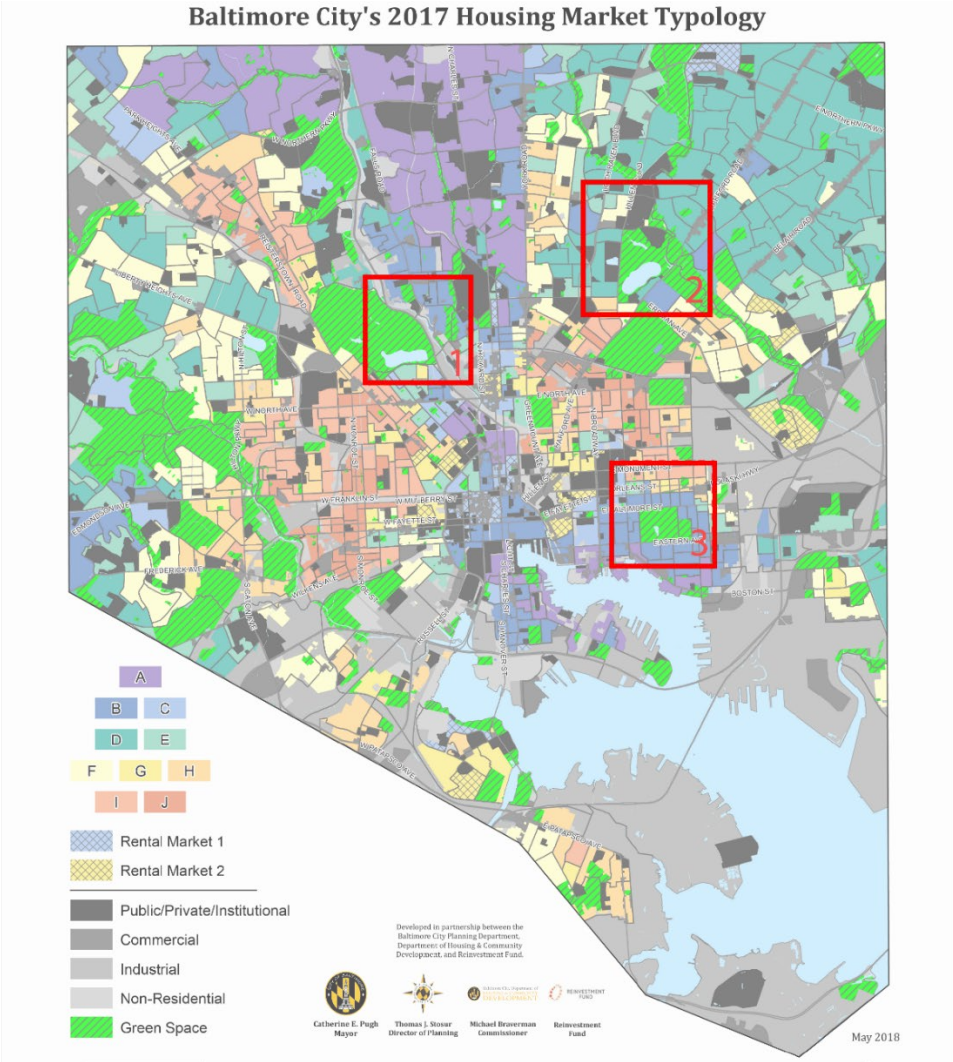
Site Selection Process

Selecting a site began with a process of observing the housing market of Baltimore. One of the biggest considerations in selecting a site was the proximity to natural features. While this senior living facility aims for an urban integration, consideration of the natural environment is still a key consideration as discussed in Chapter 6:. Additionally, affordability is an observed challenge following lessons from precedent analysis as well as learning the poverty rate of 17.4% of seniors in the city of Baltimore.[137] The areas selected aimed to settle somewhere in the middle of the housing market with leeway for higher or lower typologies.

After settling on three focus areas, a series of studies were conducted to observe the nearby basic necessities, transportation, accessibility, and proximity to natural elements. The following set of diagrams walks through those studies and zooms in on one particular contesting site in each region observed. The first site is located in Upper West Baltimore in Woodberry. The site is an old, abandoned warehouse that has great potential for redevelopment and backs into Druid Hill Park. The second is a triangular site on Herring Run Park, serving as a hinge between Morgan State University to the north and residential neighborhoods to the East and West. The third candidate is located near Patterson Park. The site itself is a parking lot occupying approximately 2.76 acres of land. This site neighbors Johns Hopkins Hospital at its Northwest corner, a Children's Center to its West face, and a thriving neighborhood to the south. To the northeast of this site is a neighborhood that, despite its proximity

[137] (Roberson and Klingenmaier 8)

to the hospital and excellent housing market below, is in one of the lowest tiers of the housing market. Though this area has a similar appearance in terms of its architecture, there is little value in the land served by few assets.



Market	Number of BG	Median Sales Price	Sales Price Variance	Foreclosures as % of Sales	% of Land either Vacant Building or Vacant Land	% Owner Occupied	% Residential Properties >$10k Permits	Housing Units per Acre
A	42	$ 403,995	0.53	7.7%	0.3%	61.5%	5.0%	8.2
B	78	$ 223,970	0.48	10.3%	1.0%	55.9%	4.8%	33.4
C	23	$ 191,953	0.56	14.2%	5.8%	21.2%	5.2%	32.1
D	92	$ 102,989	0.53	26.9%	1.4%	78.1%	3.5%	10.0
E	57	$ 89,397	0.64	25.2%	3.8%	32.2%	3.6%	23.2
F	85	$ 52,015	0.71	30.3%	4.2%	55.8%	2.6%	18.5
G	26	$ 34,827	0.97	24.5%	9.1%	20.1%	2.5%	32.9
H	74	$ 31,332	0.82	25.6%	7.0%	51.4%	1.9%	26.5
I	82	$ 16,508	1.10	20.4%	15.9%	42.5%	1.1%	33.8
J	46	$ 9,249	1.16	15.8%	21.1%	33.4%	0.7%	38.5
Split	10	$ 124,461	0.54	20%	5%	49%	4%	27.0
Other	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Figure 8-5: Housing Market Typology of all of Baltimore- Three Focus Areas Selected
(Image: author; source: Baltimore City Planning Department)

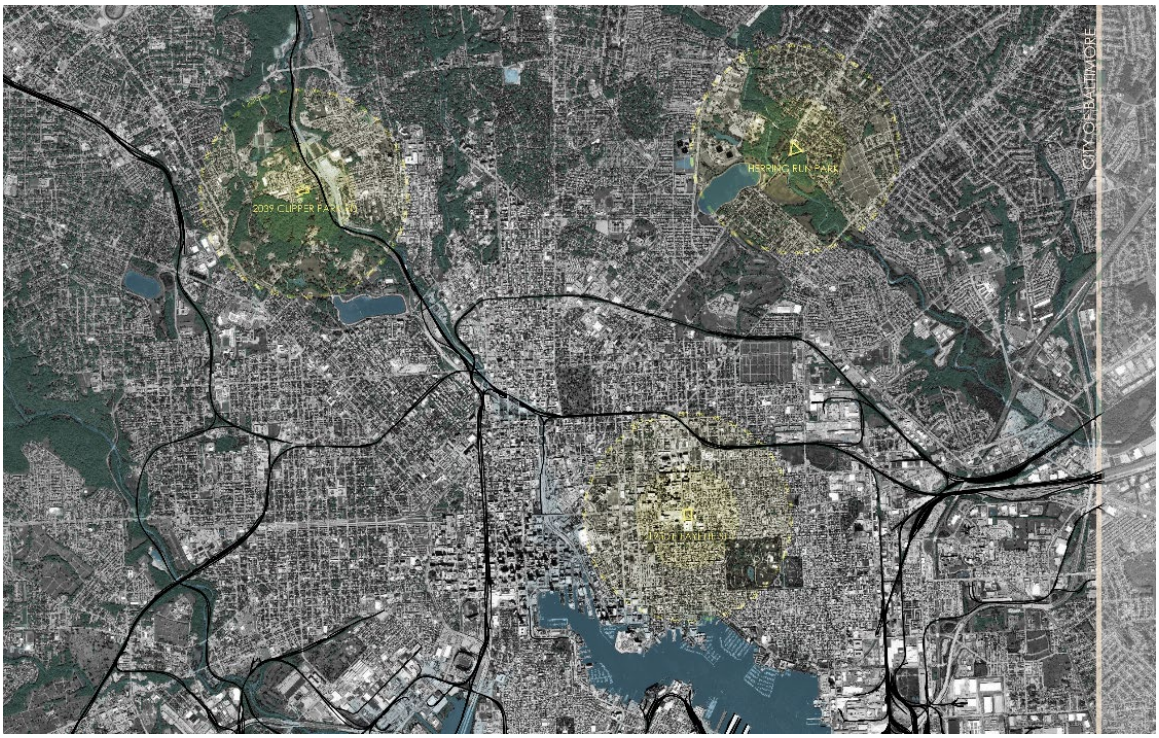


Figure 8-6: Map of Baltimore Focused on Three Interest Areas
(Image: author)

Figure 8-7: Chosen Areas Proximity to Circulator Bus Routes
(Image: author)

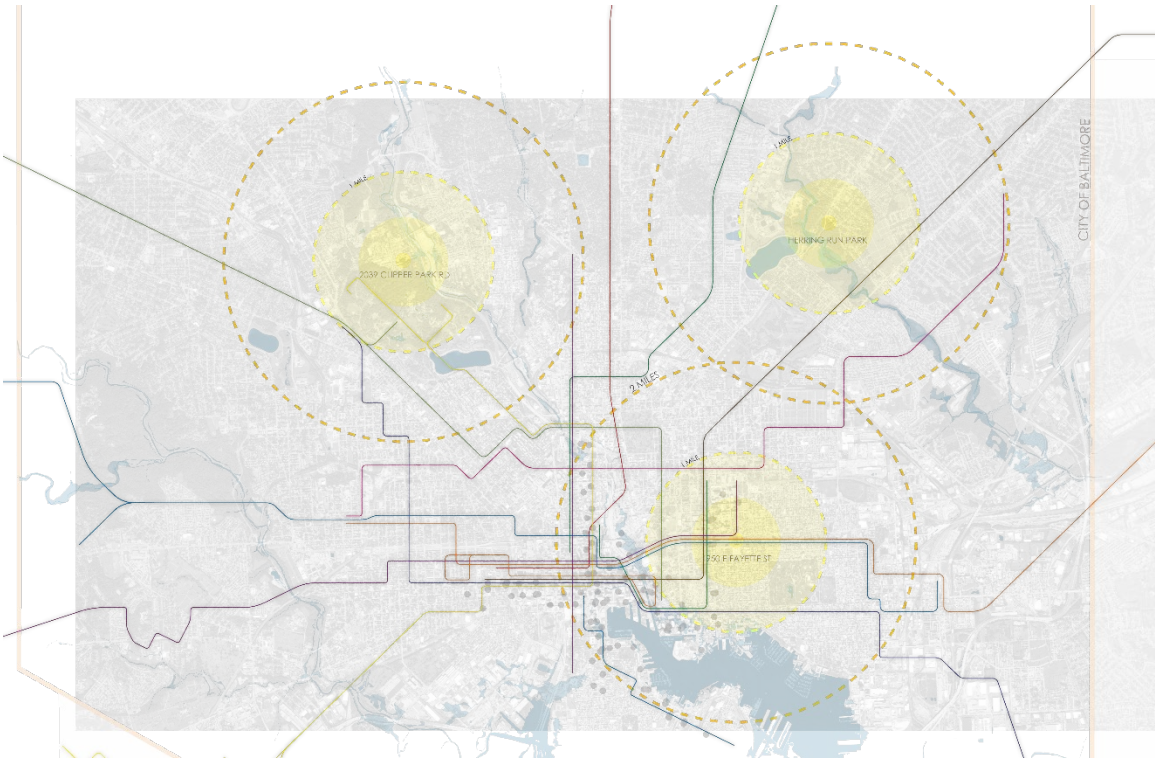


Figure 8-8: Chosen Sites Proximity to Commuter Bus Routes
(Image: author)

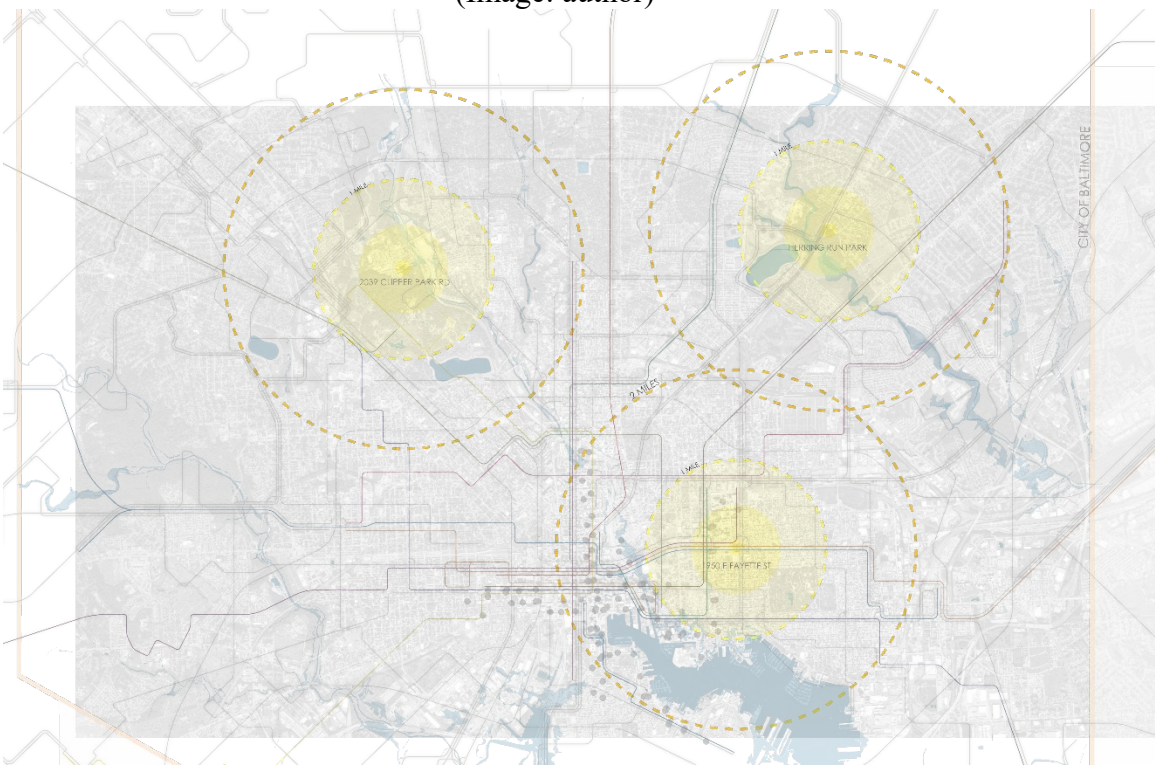


Figure 8-9: Chosen Sites Proximity to All Local Bus Routes
(Image: author)

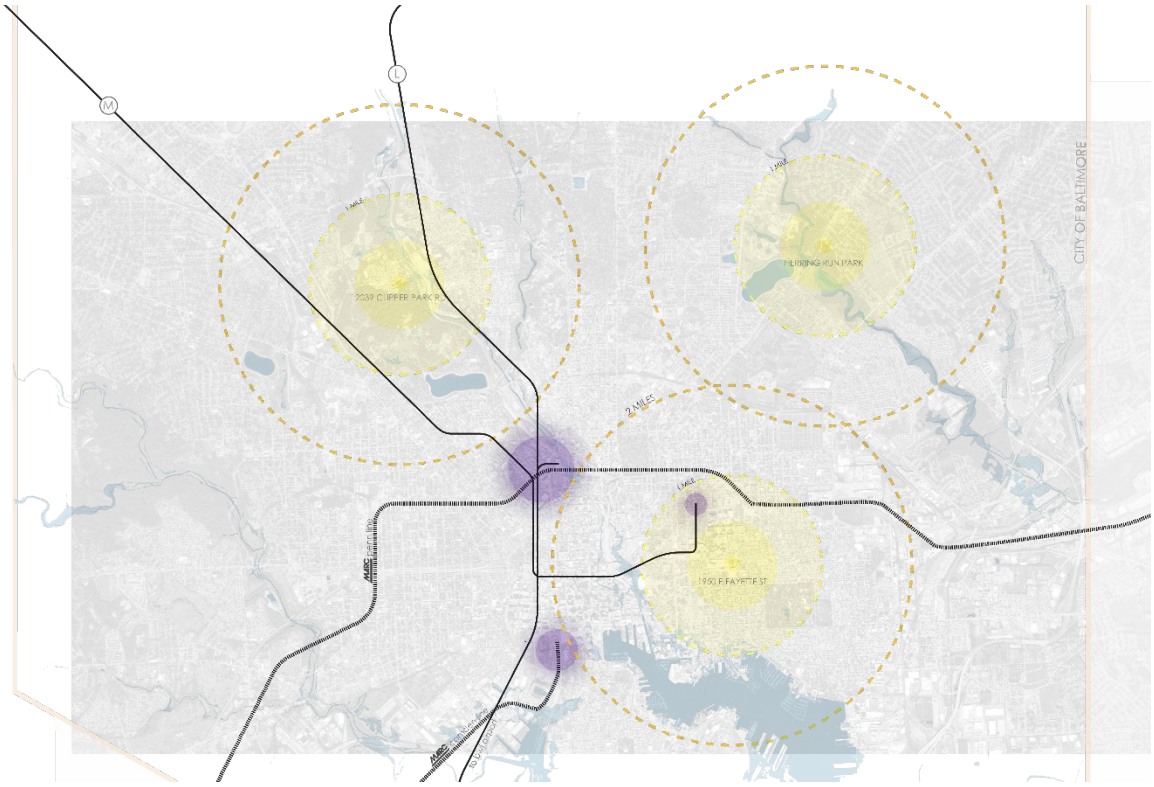


Figure 8-10: Chosen Sites Proximity to Transportation Routes Out of the City (Image: author)

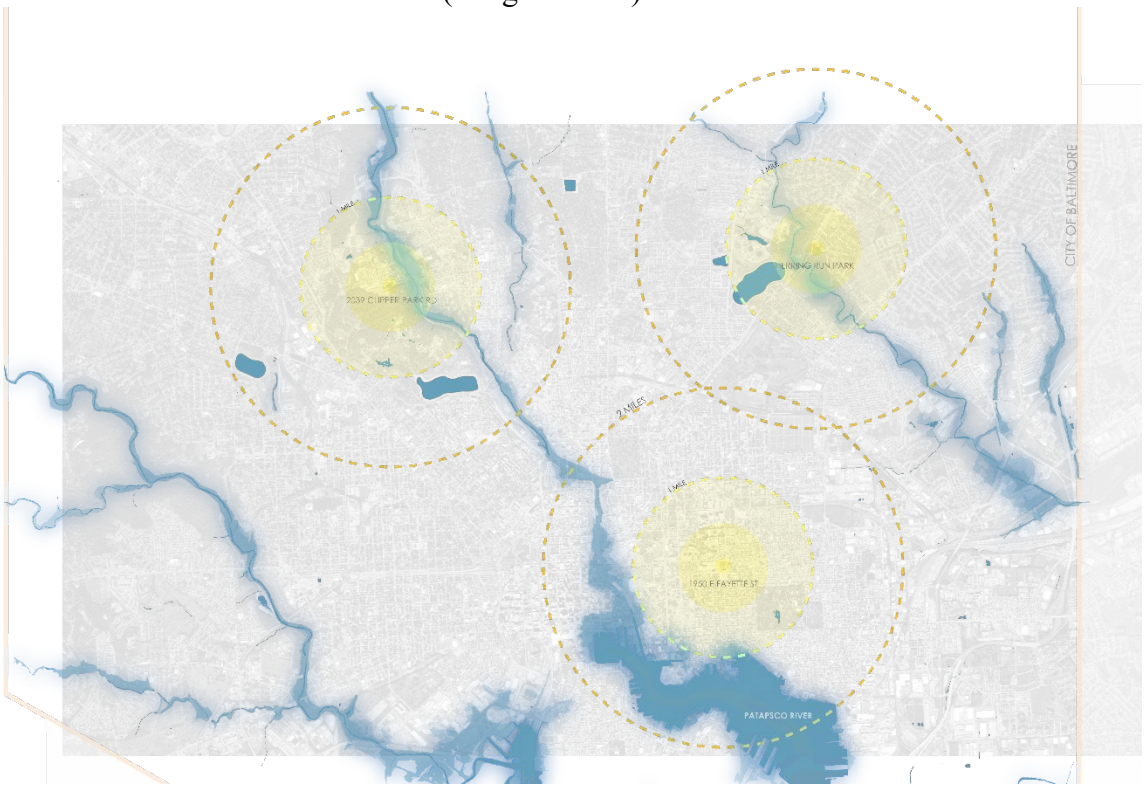


Figure 8-11: Chosen Sites in Relation to Bodies of Water and Floodplains (Image: author)

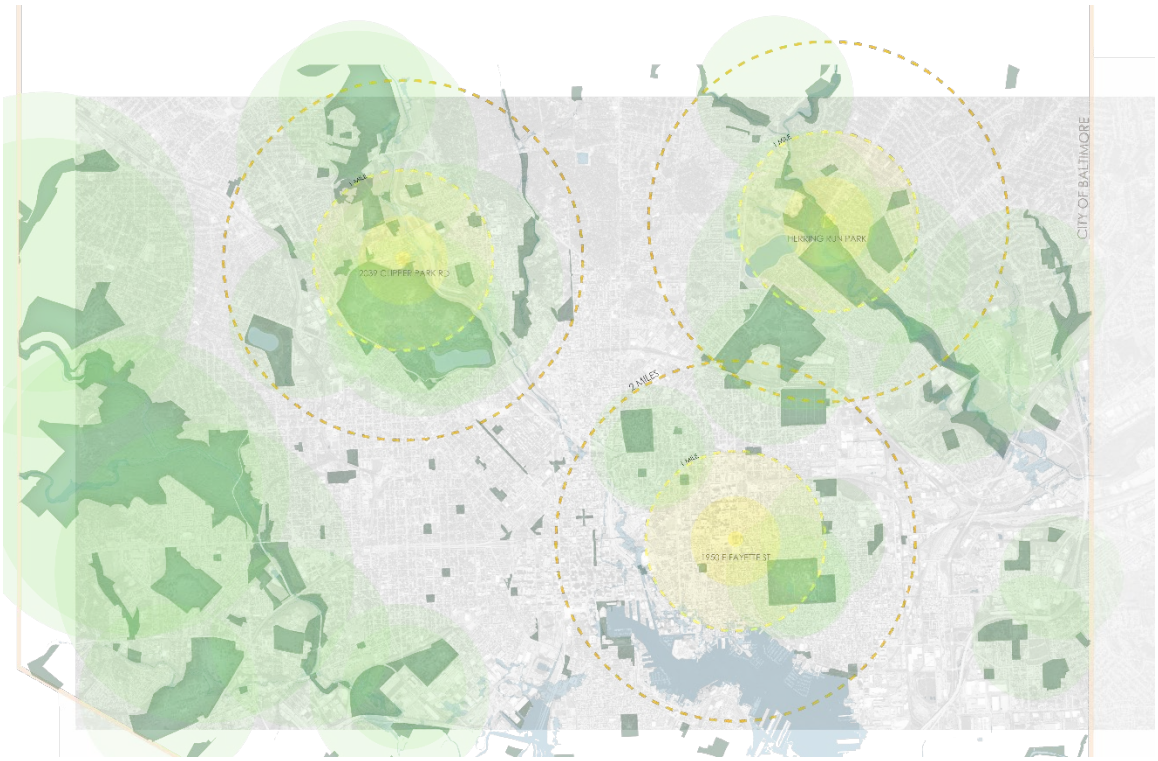


Figure 8-12: Chosen Sites in Relation to Green Spaces and Parks Around the City
(Image: author)

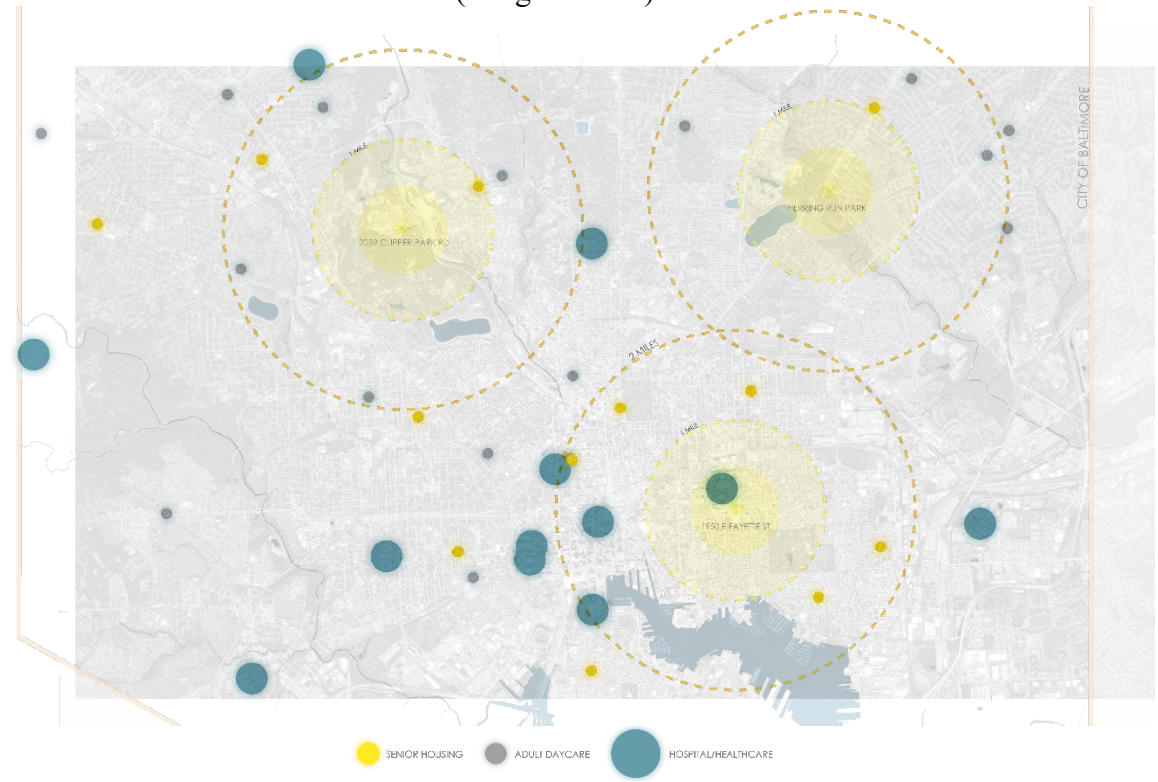


Figure 8-13: Chosen Sites Proximity to Senior Housing, Adult Daycares, and Hospitals
(Image: author)

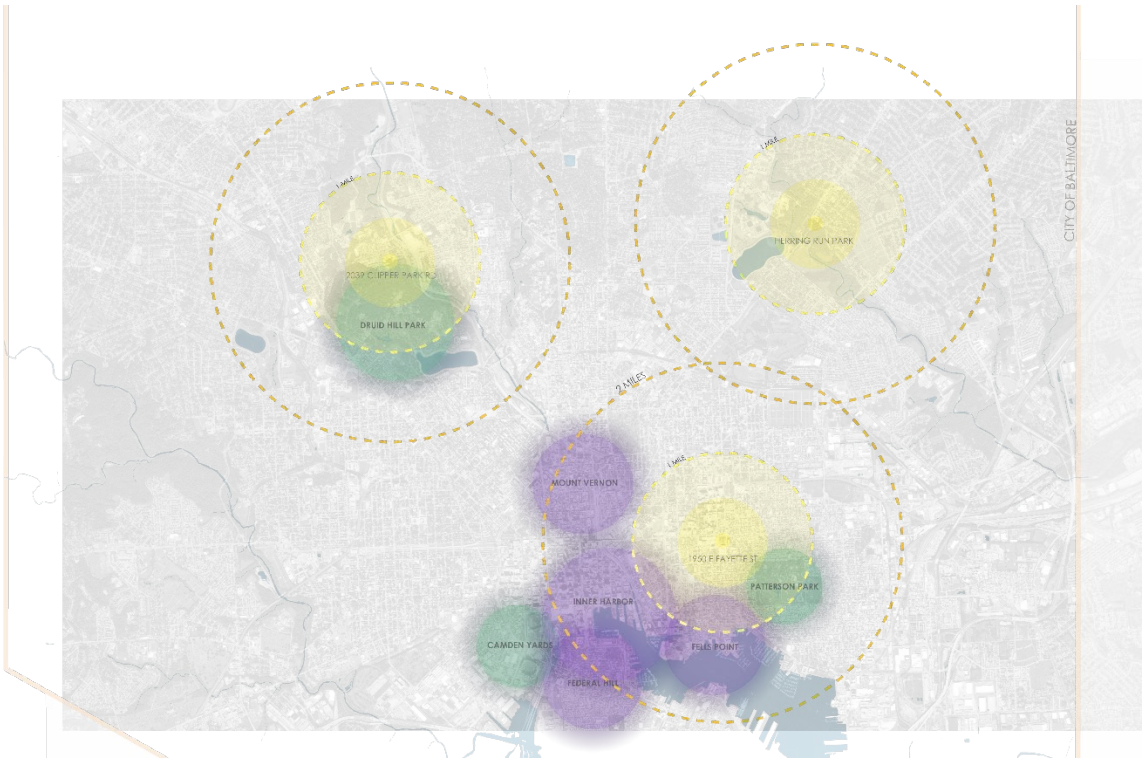


Figure 8-14: Chosen Site in Proximity to Zones of Interest
(Image: author)

Figure 8-15: Chosen Sites Proximity to Universities
(Image: author)

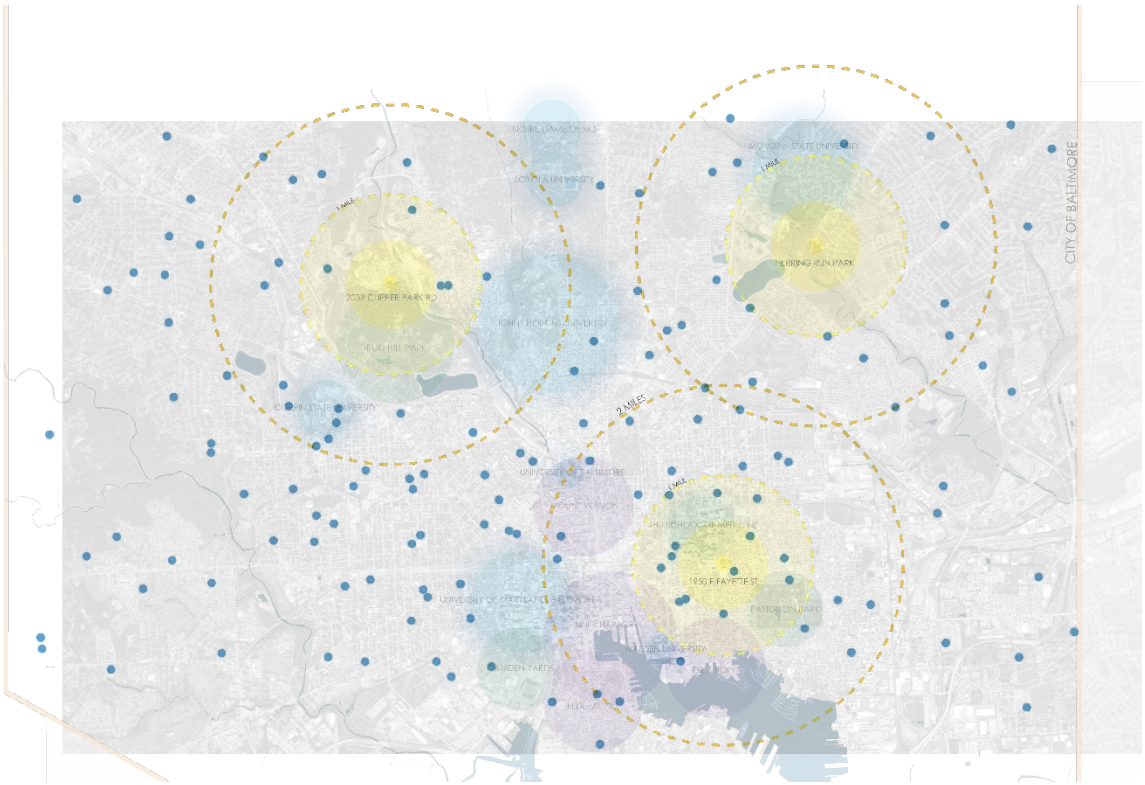


Figure 8-16: Chosen Sites Proximity to Public Education Facilities
(Image: author)

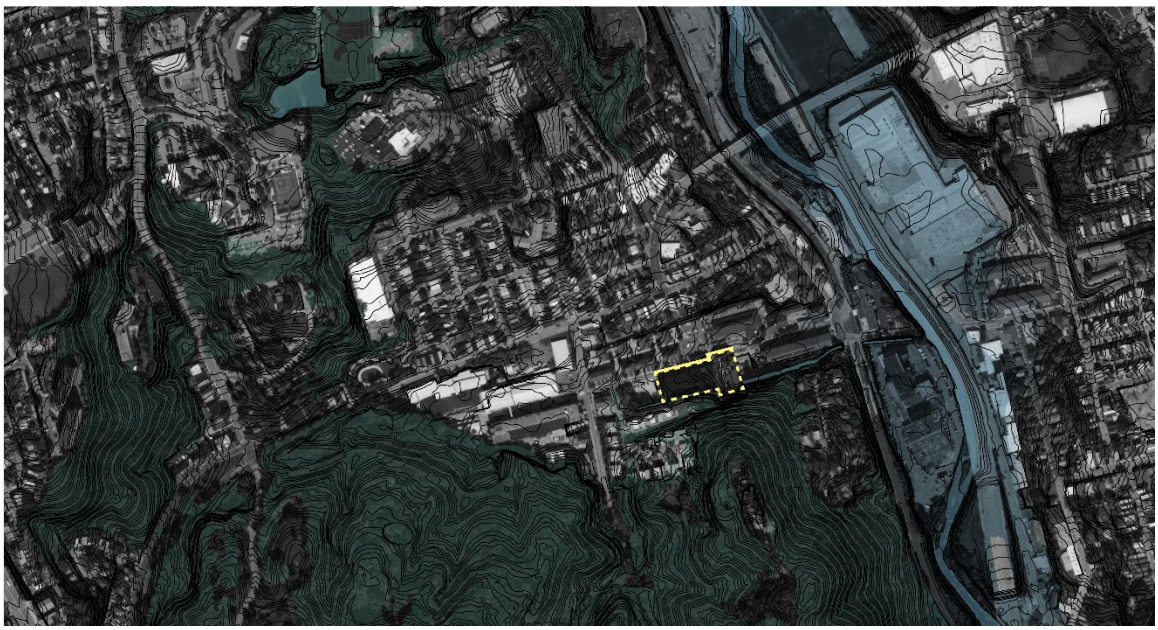


Figure 8-17: Site 1 2039 Clipper Park Road
(Image: author)

Figure 8-18: Site 2 Herring Run Park
(Image: author)

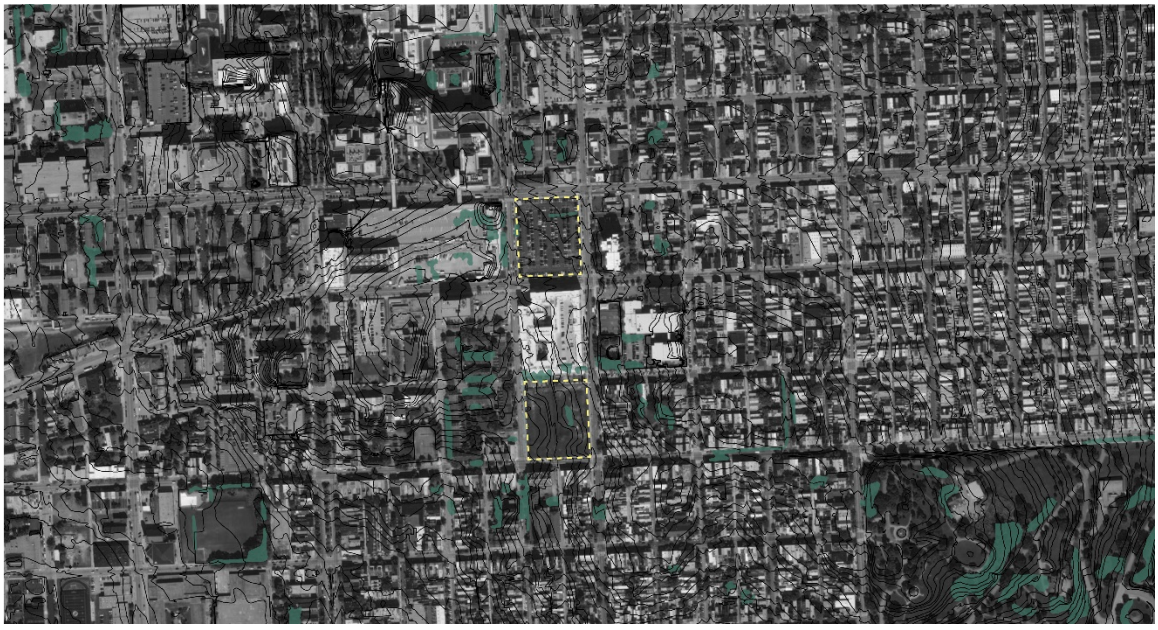


Figure 8-19: Sites 3 & 4 in Context
(Image: author)

Following this analysis of the areas at large, the sites shown in Figure 8-17 were selected as the most likely candidates. Figure 8-19 reflects a later addition to the site selection process, the southern site. All four sites were then analyzed at a closer scale to study what each site has to offer in comparison to one another.

Figure 8-20: Site 1 2039 Clipper Park Road
(Image: author)

Figure 8-21: Site 1 Access - Public Transit and Heavily Trafficked Boundaries
(Image: author)

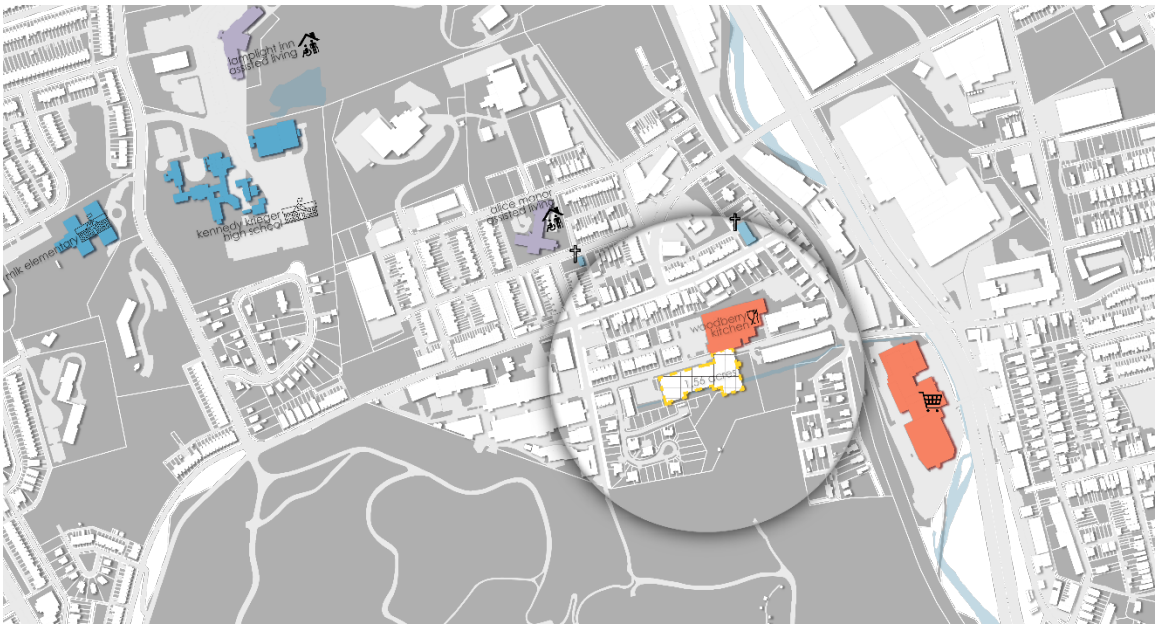


Figure 8-22: Site 1 Assets – Neighboring
(Image: author)

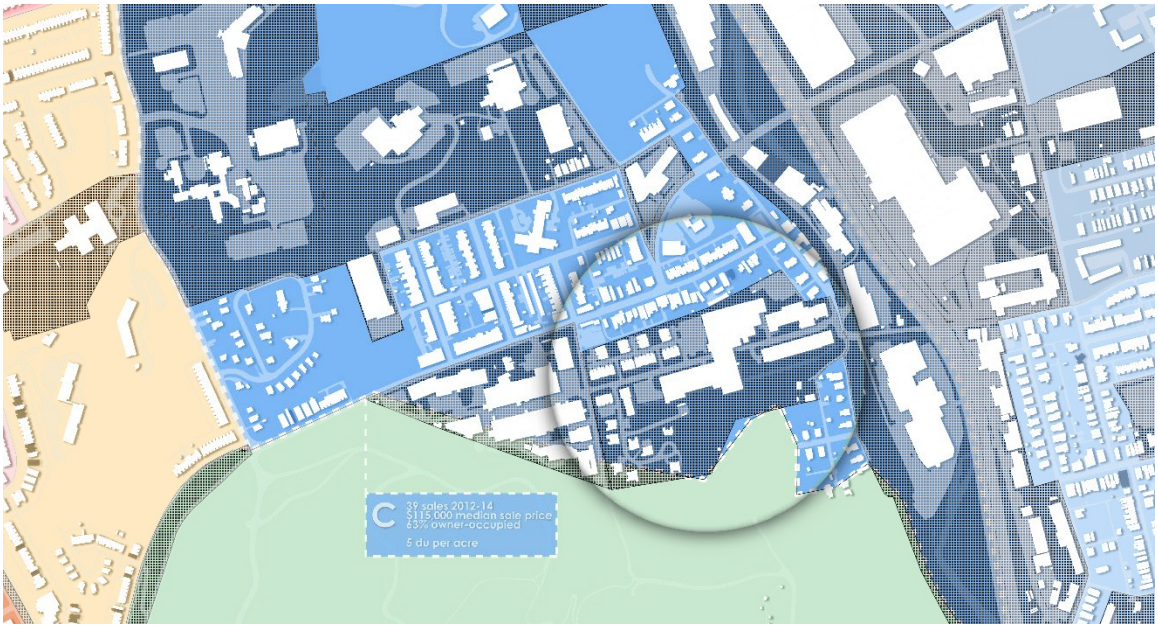


Figure 8-23: Housing Market Typology
(Image: author)

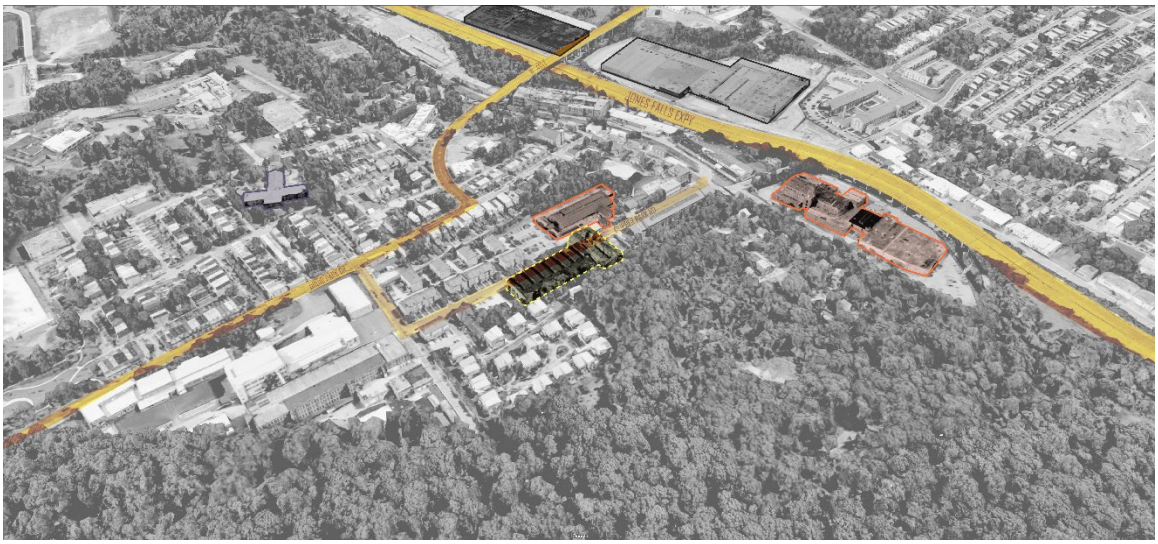


Figure 8-24: Site 1 Important Neighboring Elements
(Image: author)

Figure 8-25: Site 2 Herring Run Park
(Image: author)

Figure 8-26:Site 2 Access - Public Transit and Heavily Trafficked Boundaries
(Image: author)

Figure 8-27: Site 2 Assets – Neighboring
(Image: author)

Figure 8-28: Housing Market Typology
(Image: author)

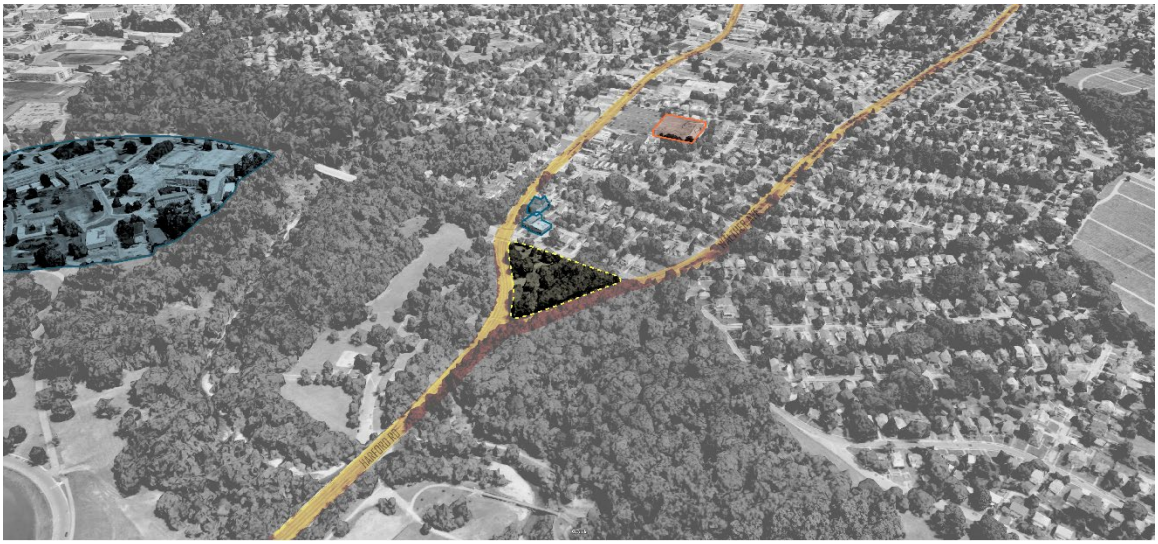


Figure 8-29: Site 2 Important Neighboring Elements
(Image: author)

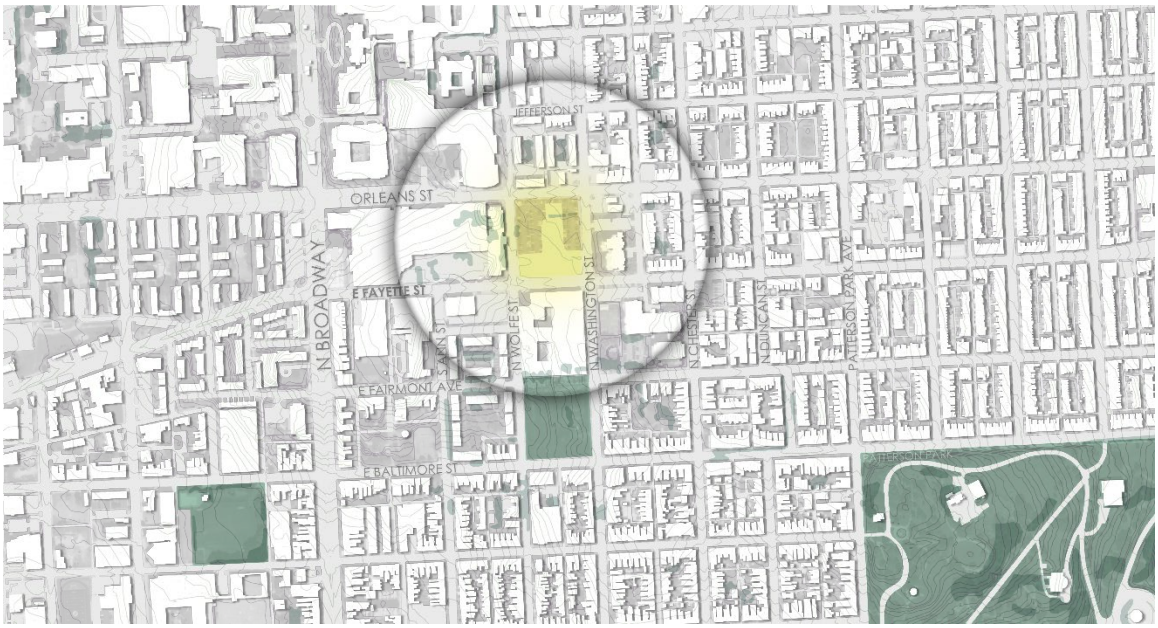


Figure 8-30: Site 3 1950 East Fayette Street
(Image: author)

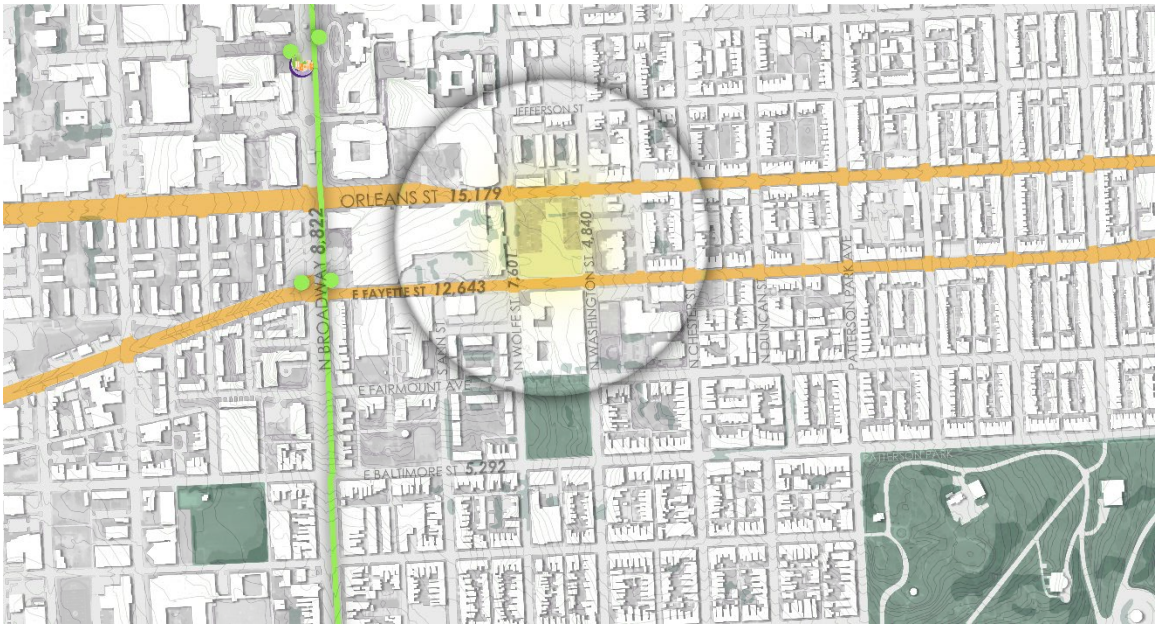


Figure 8-31: Site 3 Access - Public Transit and Heavily Trafficked Boundaries
(Image: author)

Figure 8-32: Site 3 Assets – Neighboring
(Image: author)

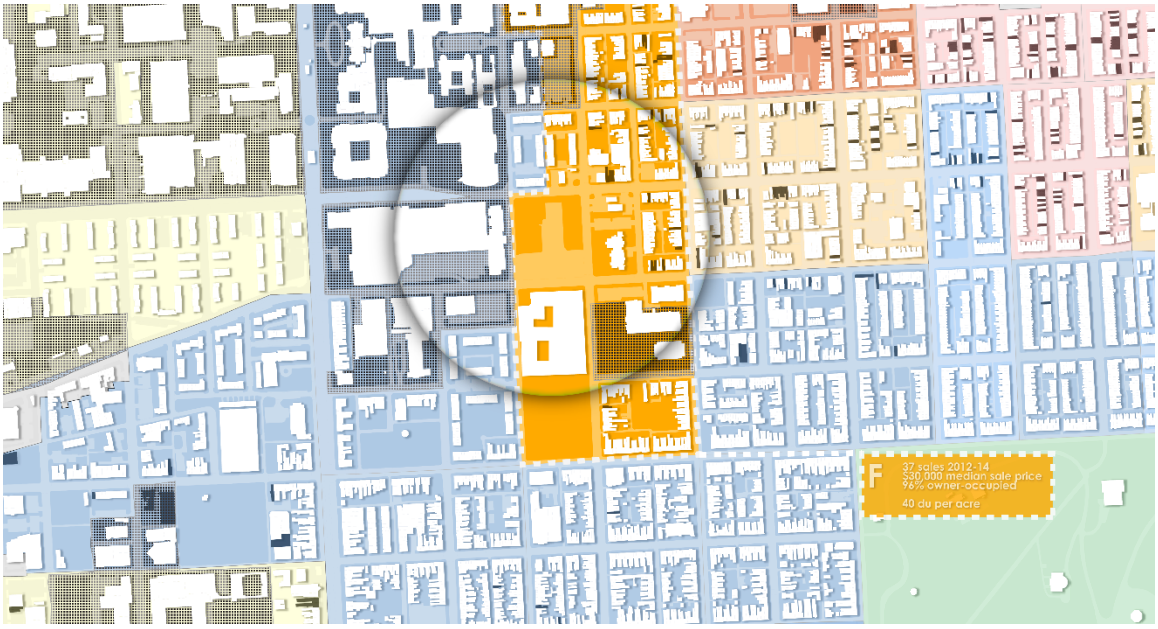


Figure 8-33: Site 3- Housing Market Typology
(Image: author)

Figure 8-34: Site 4- Dunbar Park
(Image: author)

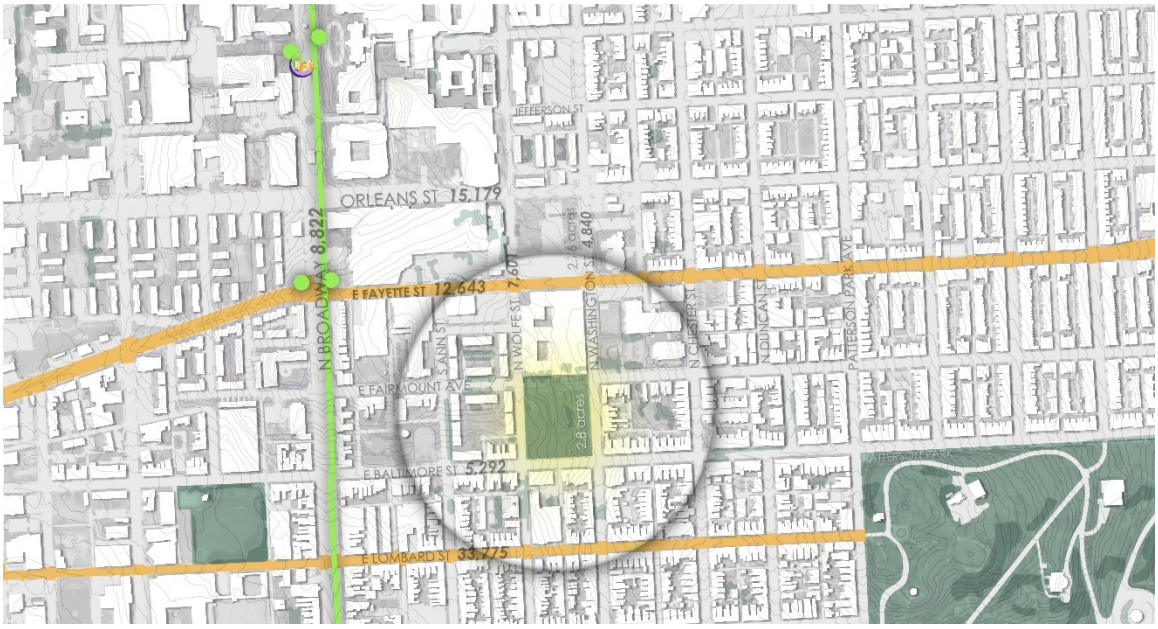


Figure 8-35: Site 4 Access - Public Transit and Heavily Trafficked Boundaries
(Image: author)

Figure 8-36: Site 4 Assets – Neighboring
(Image: author)

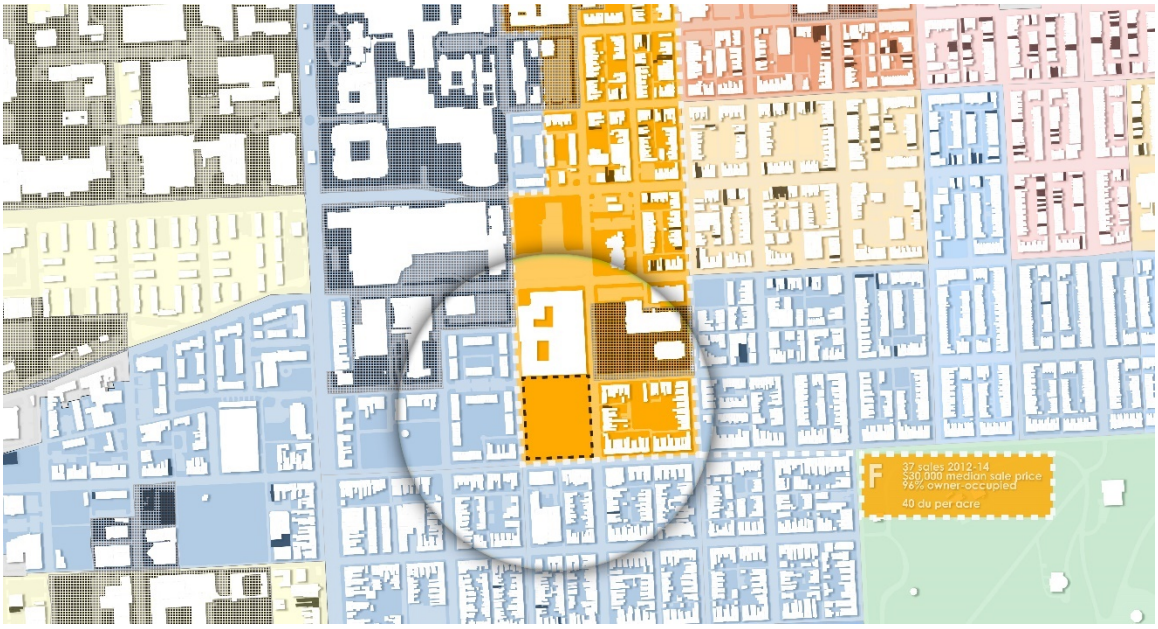


Figure 8-37: Site 4- Housing Market Typology
(Image: author)

After assessing the value of each site, a list was compiled to balance the benefits of each site and ultimately select the most promising candidate.

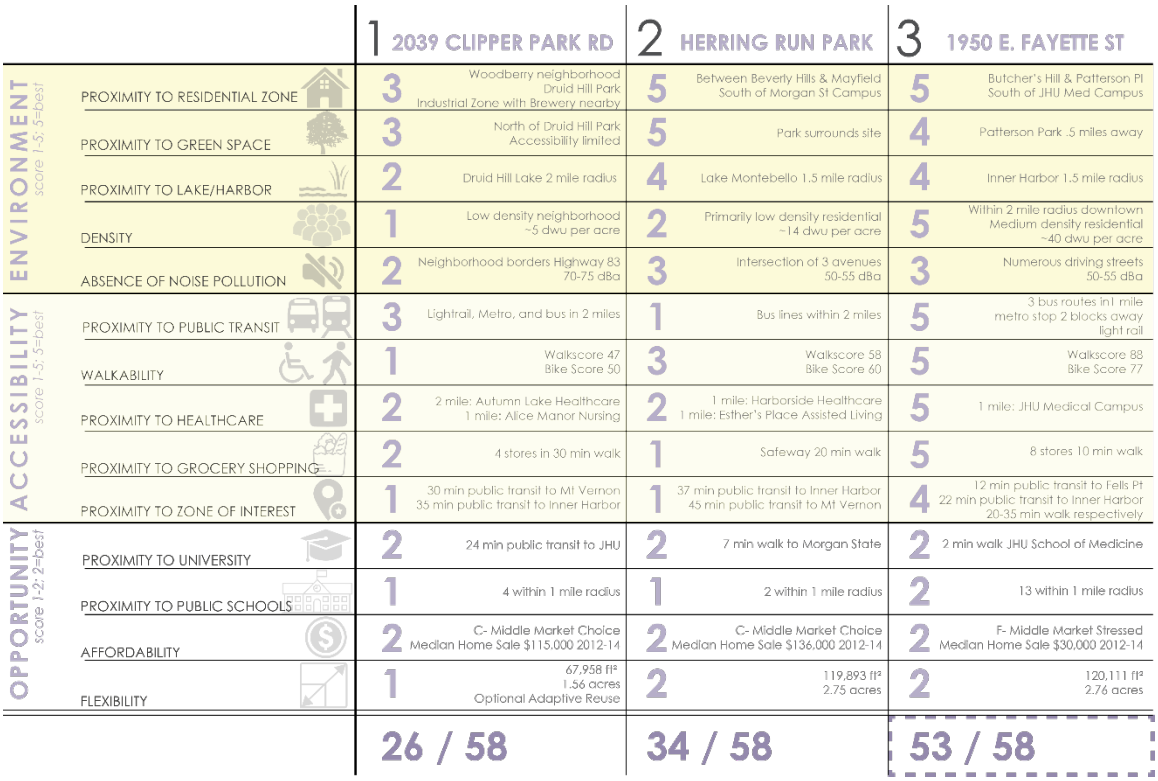


Figure 8-38: Site Selection Matrix
(Image: author)

Benefits of Chosen Site

The selected area near Patterson Park presented the most opportunities in terms of development for the purpose of an intergenerational care facility catering to seniors and children. The location is of utmost importance, as observed in precedents both within and beyond Baltimore. This site also presents a unique opportunity to bring value to a neighborhood that currently sits towards the bottom of the market, categorized as Housing Type F- Middle Market Stressed. The site itself presents a variety of opportunities considering its large size, accessibility by public transportation, and proximity to a valuable assets such as Patterson Park, the Inner Harbor, and most importantly Johns Hopkins Hospital. The following images compare the benefits of sites 3 and 4 side by side.

Figure 8-39: Site 3 Important Neighboring Elements
(Image: author)

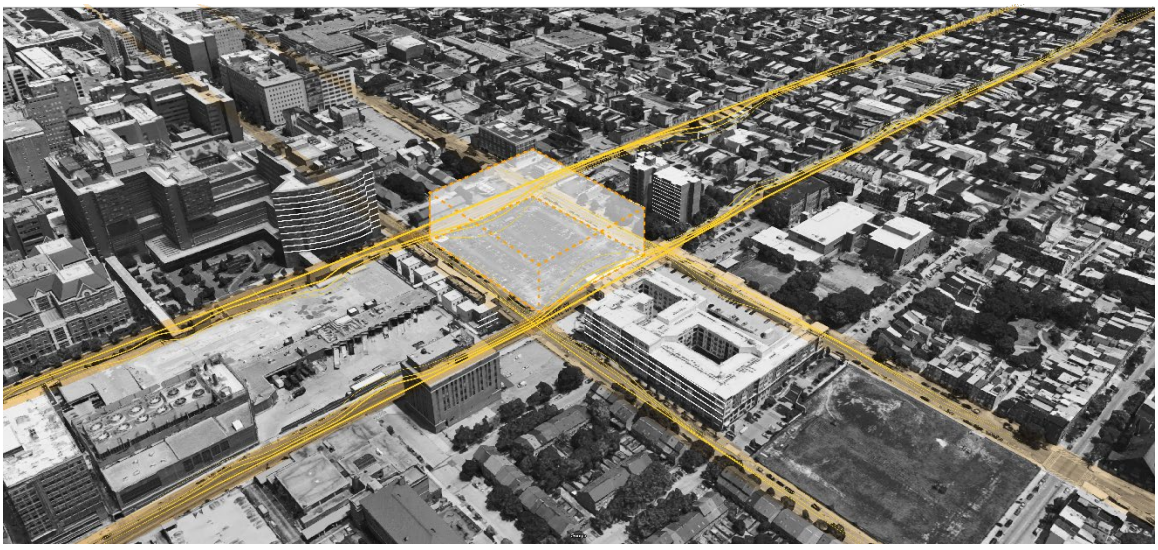


Figure 8-40: Site 3 Sound Pollution from Traffic
(Image: author)

Figure 8-41: Site 3 Zoning Designations
(Image: author, Data: Baltimore City Planning)

Figure 8-42: Site 4 - Important Neighboring Elements
(Image: author)

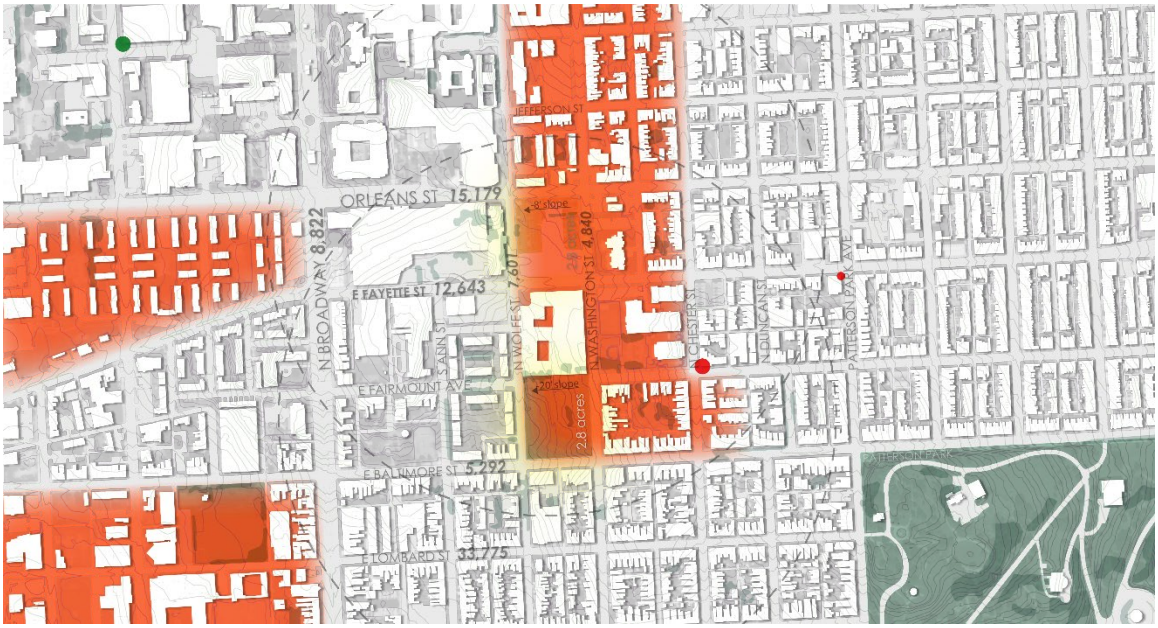


Figure 8-43: Food Deserts around Sites 3 and 4
(Image: author)

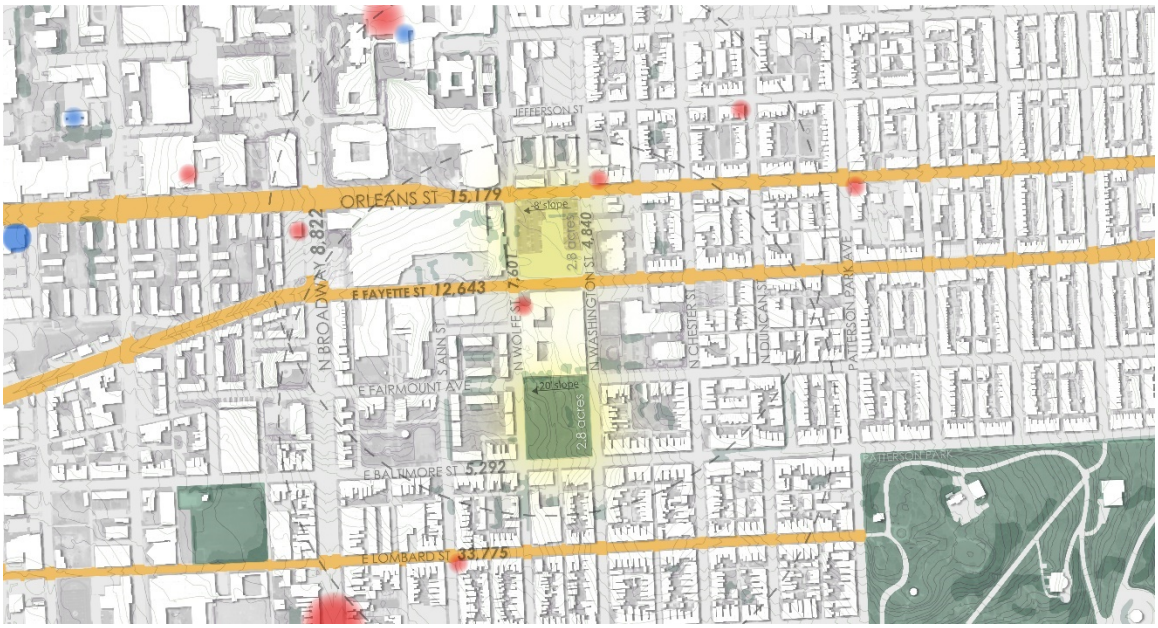


Figure 8-44: Comparison of Neighboring Libraries (blue) Restaurants (red) and Traffic
(Image: author)

Sites 3 and 4 will be further explored in the schematic development phase of the project.

All of the residential zones in Baltimore allow for single family detached dwellings at 5.9 dwelling units per acre. A higher value after the R indicates a higher density- so R-8 allows for "single-family semi-detached housing (21.7 units per acre), single family attached townhouses (58 units per acre) and multi-family housing (58 units per acre)"[138]. Nearby this site there are zones designated as R-10. R-10 is the densest residential zone. It allows for "single-family semi-detached housing (21.7 units per acre), single family attached townhouses (58 units per acre) and multi-family housing (217.8 units per acre)." The Office-Residential Zones do not allow for retail, and they follow similar guidelines to the Residential Zones. The O-R zones

[138] Baltimore City Zoning. Explanation of City Zoning Categories.

accommodate for the influx of mixed use near major thoroughfares, promoting development and urban stability.

The site selected falls under R-8, which accounts for numerous zoning regulations including (but not limited to):[139]

1. Accessory shops in a multiple-family building that contains 50 or more dwelling and efficiency units, subject to the following conditions:
    a. the uses are limited to dining room, cocktail lounge, drug store or pharmacy, newsstand, retail food shops, beauty shops, barber shops, and similar personal service shops primarily for the occupants of the building;
    b. the aggregate of all such uses may not exceed 5% of the gross floor area of the building
2. Principal conditional uses in an R-8 District must comply with the minimum lot area and the maximum lot coverage requirements for single-family detached dwellings, except as follows:
    a. Housing for the elderly
        i. Minimum lot area:165 sq. ft. per efficiency unit and 245 sq. ft. per other dwelling unit
        ii. Maximum lot coverage: Per FAR
3. Principal conditional uses in an R-8 District must comply with the yard requirements for all principal permitted uses as set forth

[139] Aisenstark, Avery. Zoning Code of Baltimore City. Baltimore City Department of Legislative Reference, 2015.

a. All principal permitted uses

    i. None required at front and street corner side

    ii. 10 ft. for detached and semi-detached structures and for ends of groups at Interior Side

    iii. 25 ft. at Rear

b. Health and medical institutions

    i. 20 ft at Front

    ii. 10 ft at Interior

    iii. 15 ft at Street Corner Side

    iv. 25 ft at Rear

4. The maximum floor area ratio of all principal conditional uses in an R-8 District is 2.0, except as follows:

    a. Housing for the elderly = 4.5

Zoning codes call for regulation of buildings by the FAR values listed above. Only single family dwellings are limited in height to 35 feet tall.

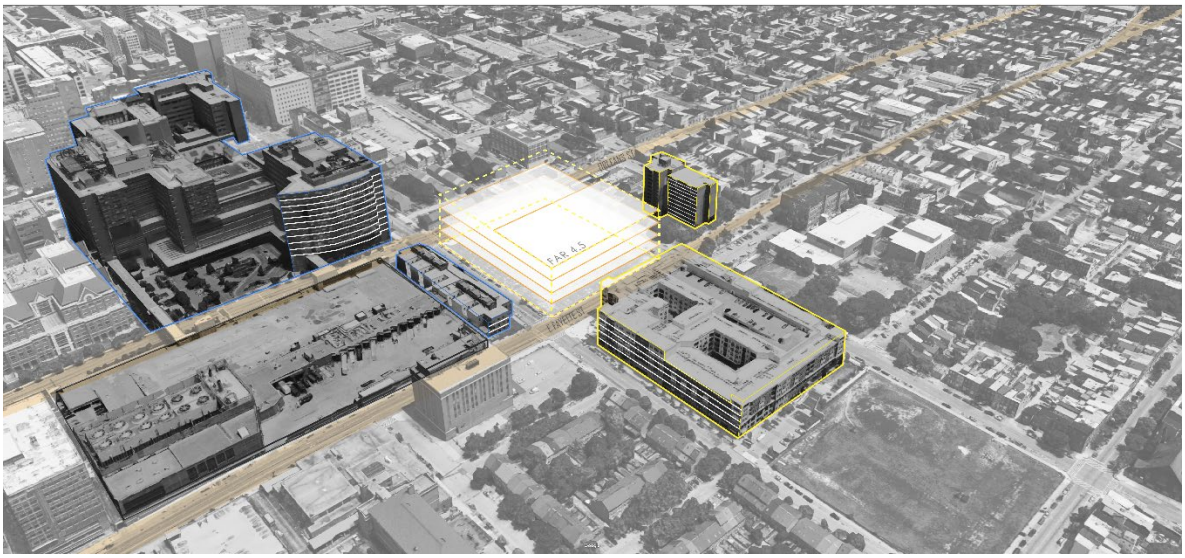


Figure 8-45: FAR of Site and Neighboring Building Heights (by stories)
(Image: author; Data: Aisenstark, Google Earth)

The zoning code defines “Housing for the elderly” with the following terms:

1. “Housing for the elderly” means a residential building”
    a. that contains 10 or more dwelling units specifically designed for the needs, use, and occupancy of people who are 60 years old or older or who are disabled;
    b. in which the only occupants other than those 60 years old or older or disabled are spouses, caretakers, or similar individuals; and
    c. in which no more than 10% of the occupied units contain spouses, caretakers, or similar individuals who are neither 60 years old or older nor disabled.
2. “Housing for the elderly” may contain medical and dental offices as an accessory use primarily for the occupants of the building.

This thesis will challenge the expectations for zoning a housing complex for the

elderly by introducing intergenerational uses. Unfortunately, there currently exists no precedent for zoning an intergenerational care community, but for the purpose of this project, the guidelines for Housing for the Elderly will be the driving zoning regulations.

Chapter 9: **DESIGN IMPLEMENTATION**

Schematic Exploration

A plethora of schemes were explored, exploring two separate sites. Sites 3 and 4 both fall in the neighborhood of Fells Point, west of Patterson Park. Several of the explorations looked at how the two sites would develop into different partis. The north site, just south of the John's Hopkins Hospital, would likely result in a castle-like structure. Building on this site would be wary of the sound pollution coming from the hospital. It would present an opportunity for outreach to the hospital and the generation of doctors, nurses, and college students who could use this building as a place to gather for lunch, or perhaps work with the senior residents and care for them.

Below are some of the earliest schemes explored. It was during this exploration that the question of exploring the southern site, Dunbar, came about.

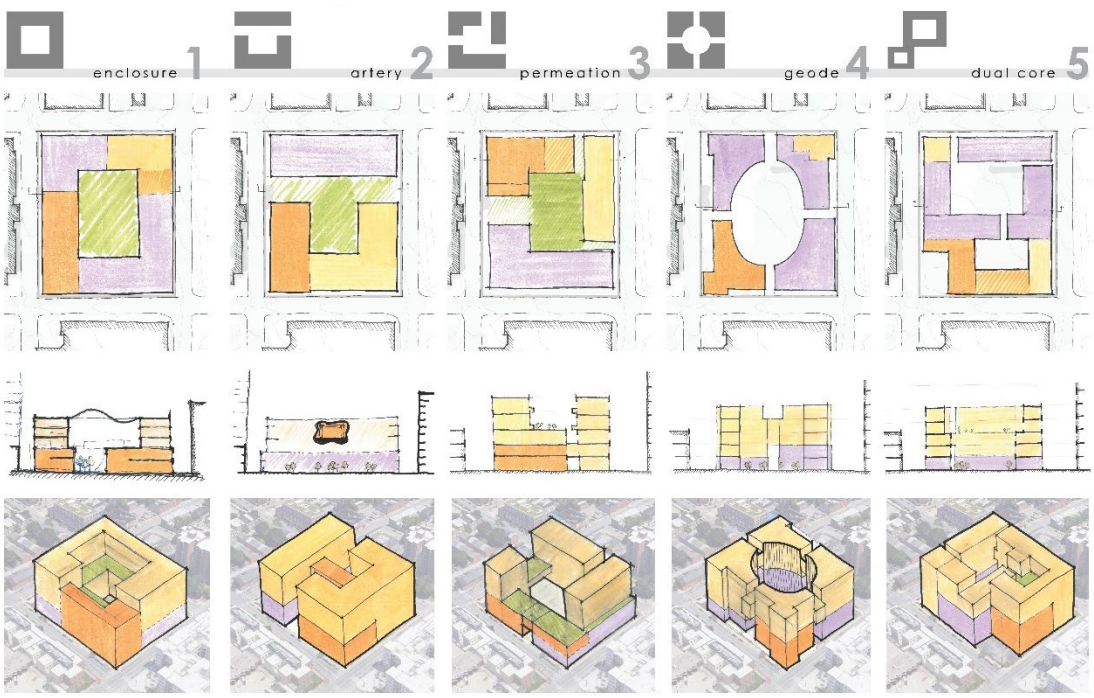


Figure 9-1: Beginning Exploration of Massing on North Site- Considering different types of courtyards
(Image: author)

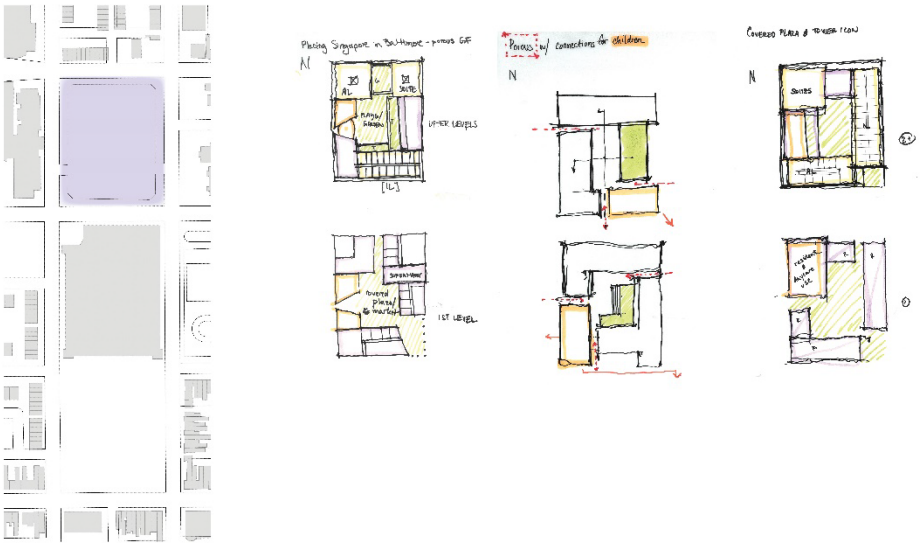


Figure 9-2: Exploring North Site Schemes
(Image: author)

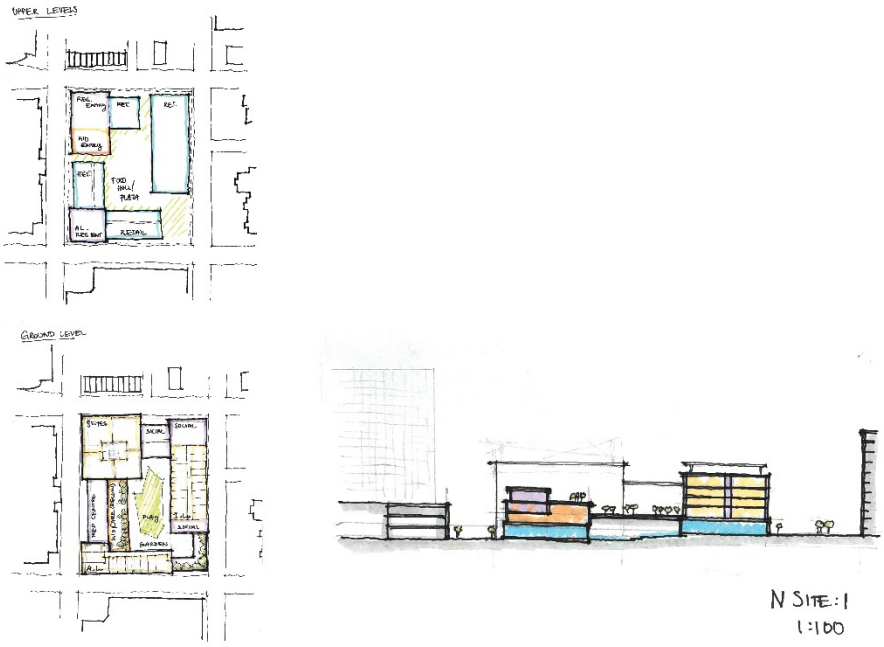


Figure 9-3: Massing and Programming Scheme 1 of North Site

(Image: author)

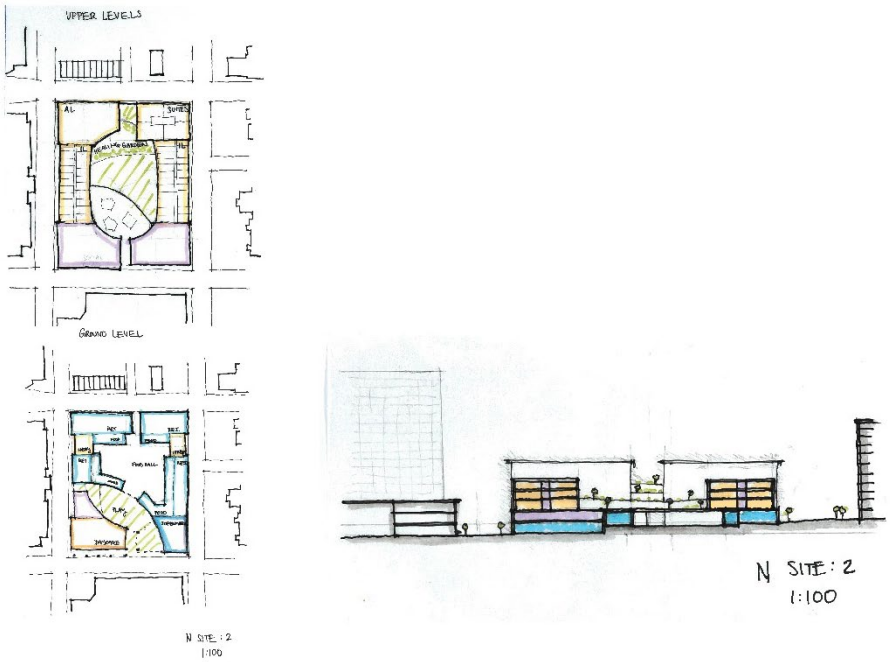


Figure 9-4: Massing and Programming Scheme 2 of North Site

(Image: author)

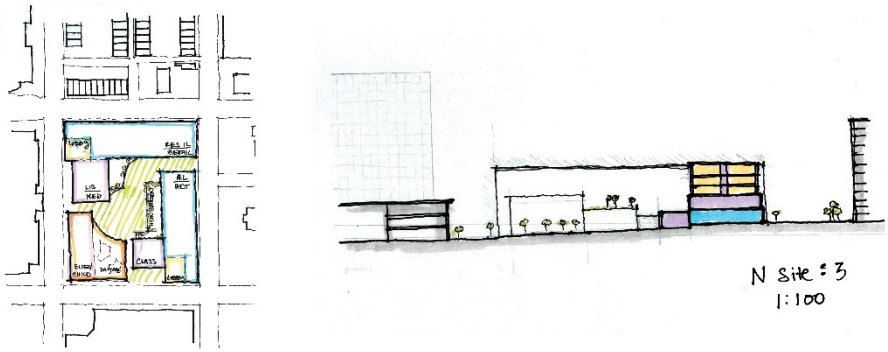


Figure 9-5: Massing and Programming Scheme 3 of North Site

(Image: author)

In contrast, the southern site, along the northern axis of Patterson Park, has an option to develop into a villa scheme with smaller buildings to reflect the housing in the neighboring context. This building could open up to the context as it is located in a healthy thriving neighborhood. It could supplement this neighborhood by providing infrastructure to support the families in the area. While both sites could improve the

circumstances of the neighborhood to improve the social infrastructure, this site has more chances to open itself up to the neighborhood rather than wall off from the institutionalization of the hospital.

Figure 9-6: Exploring South Site Schemes
(Image: author)

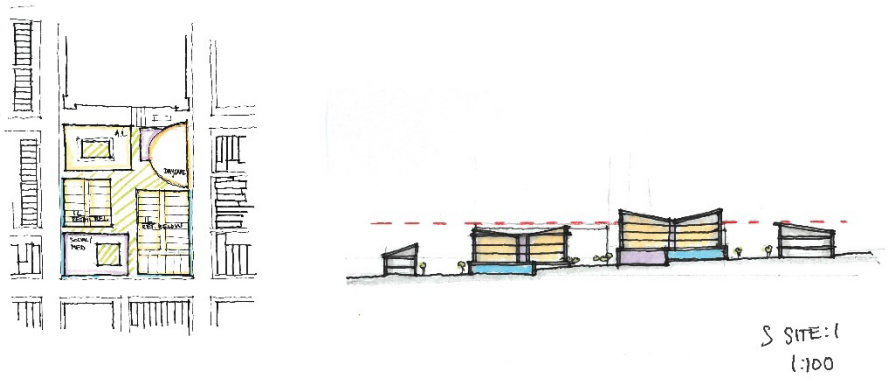


Figure 9-7: Massing and Programming Scheme 1 of South Site
(Image: author)

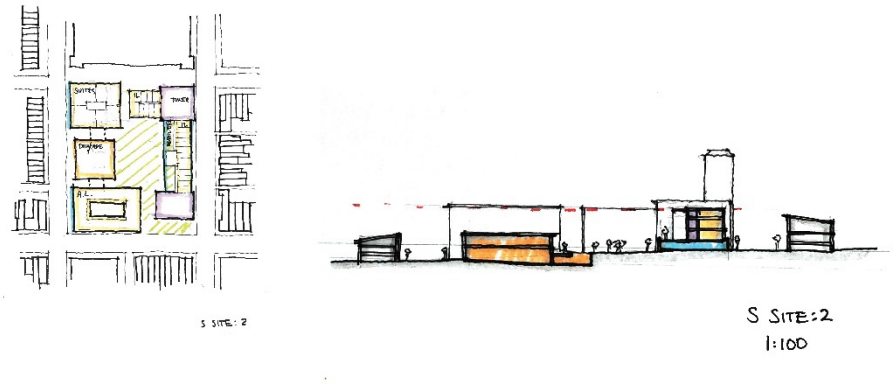


Figure 9-8: Massing and Programming Scheme 2 of South Site
(Image: author)

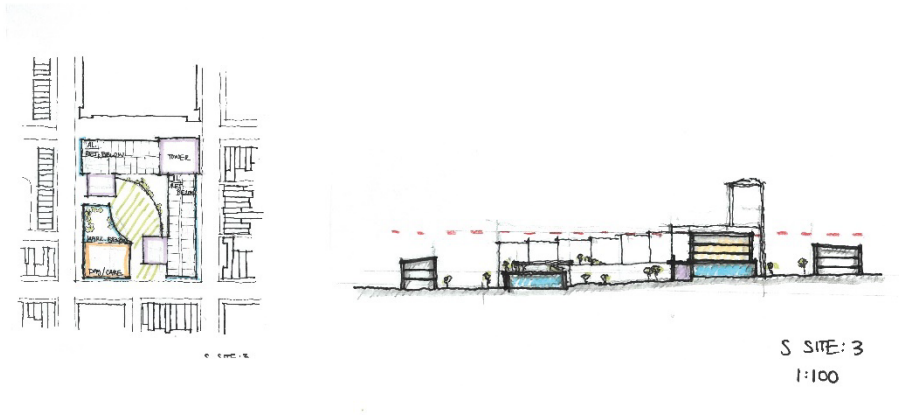


Figure 9-9: Massing and Programming Scheme 3 of South Site
(Image: author)

Figure 9-10: Massing Models of Early Schemes
(Image: author)

All early schemes explored an organization around a courtyard. As the schemes moved forward, the design focused more on the open space between the built forms rather than prioritizing the built forms first.

As the schemes developed, a decision was made to focus on pursuing the southern site. This site, similar is scale and dimension though with a more drastic topographical slope from East to West, offers a more neighborhood-friendly opportunity that may be better suited to designing for seniors and children.

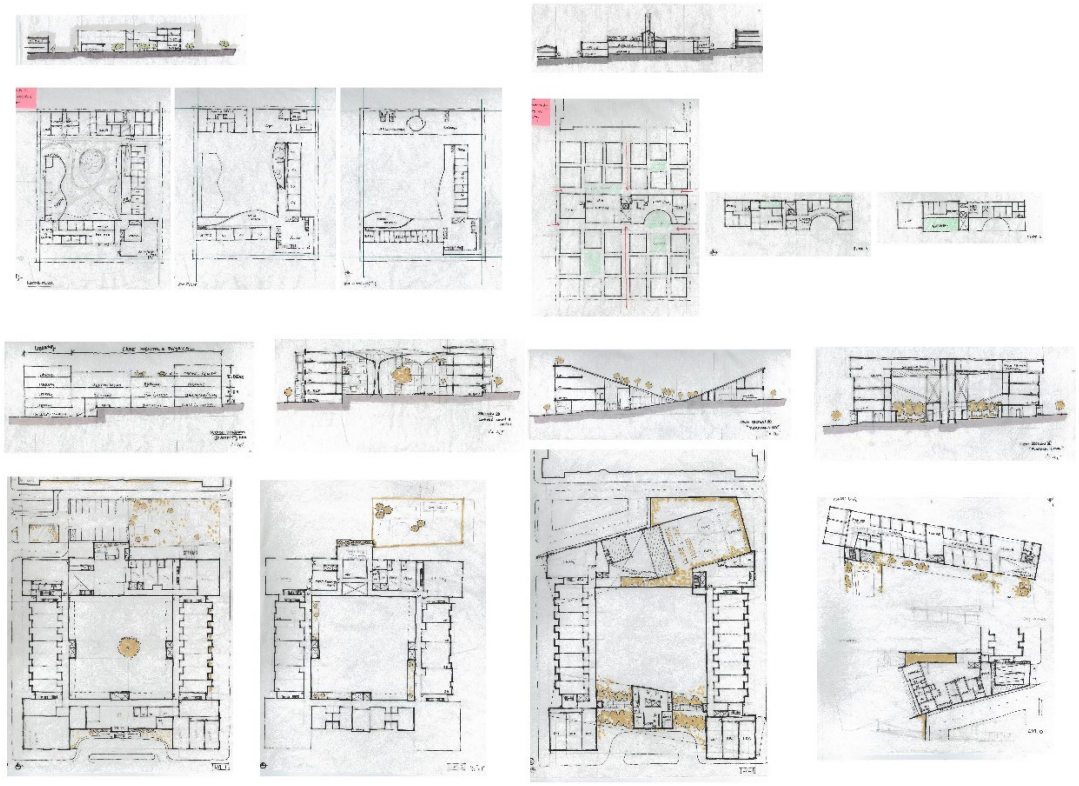


Figure 9-11: Process Sketches of Ideas for Southern Site
(Image: author)

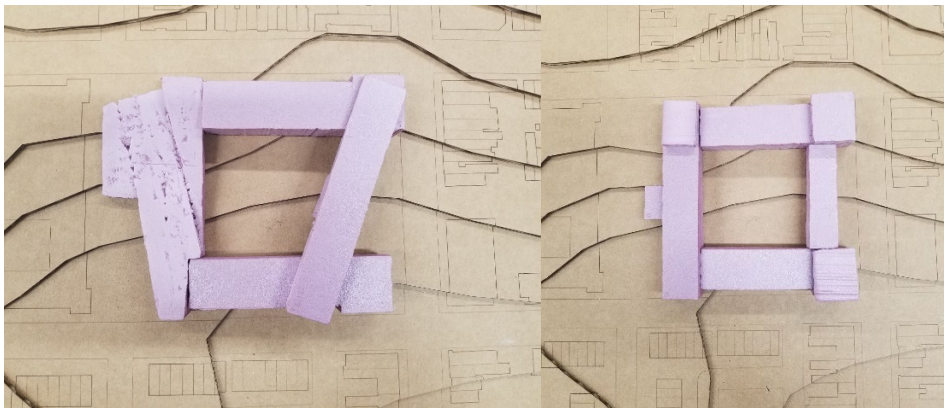


Figure 9-12: Study Models of Further Explorations
(Image: author)

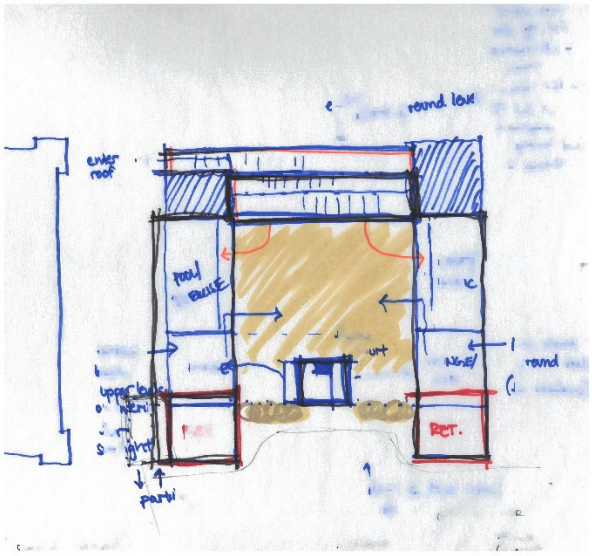


Figure 9-13: Development of Ground Level Organization
(Image: author)

Figure 9-14: Exploration of Unit Layouts
(Image: author)

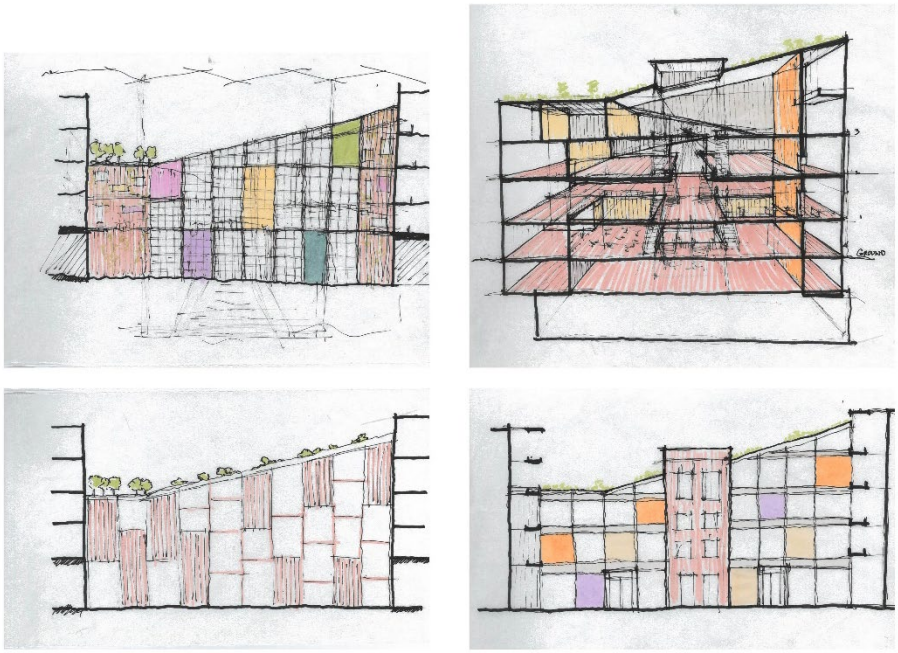


Figure 9-15: Exploration of Earlier Form of Learning Center
(Image: author)

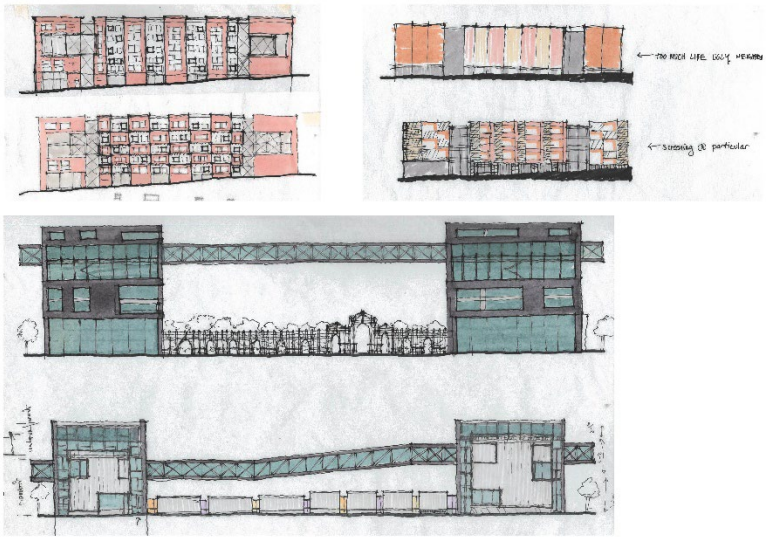


Figure 9-16: Explorations of Facade Treatments
(Image: author)

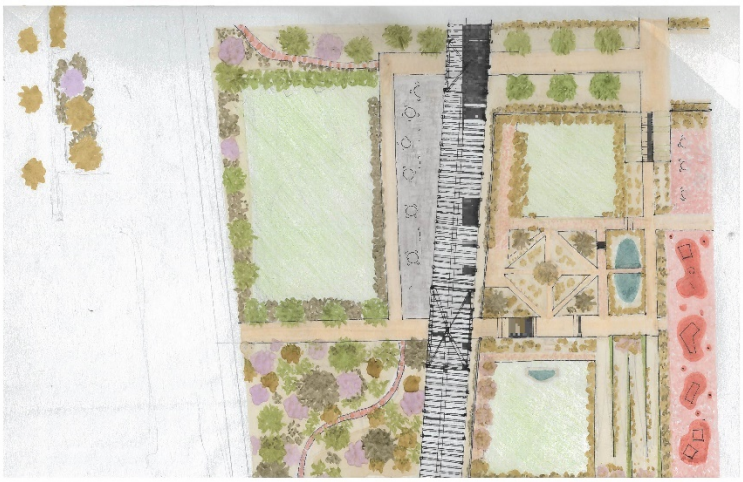


Figure 9-17: Sketched Plan for Courtyard
(Image: author)

The design process resulted in the decision to focus on independent living units in the senior living part of the building.

Sketches above will show explorations of a sloping roof that is walkable. This was evaluated as a security threat that might invite any passerby to enter the site, ultimately breaching the safety of the children and the residents. The non-linear design process resulted in a courtyard building with three major facades to the street.

Parti Development

After numerous iterations of various scales of partis, a scheme that maximized a central courtyard and built forms flanked three edges of the courtyard developed into the final design.

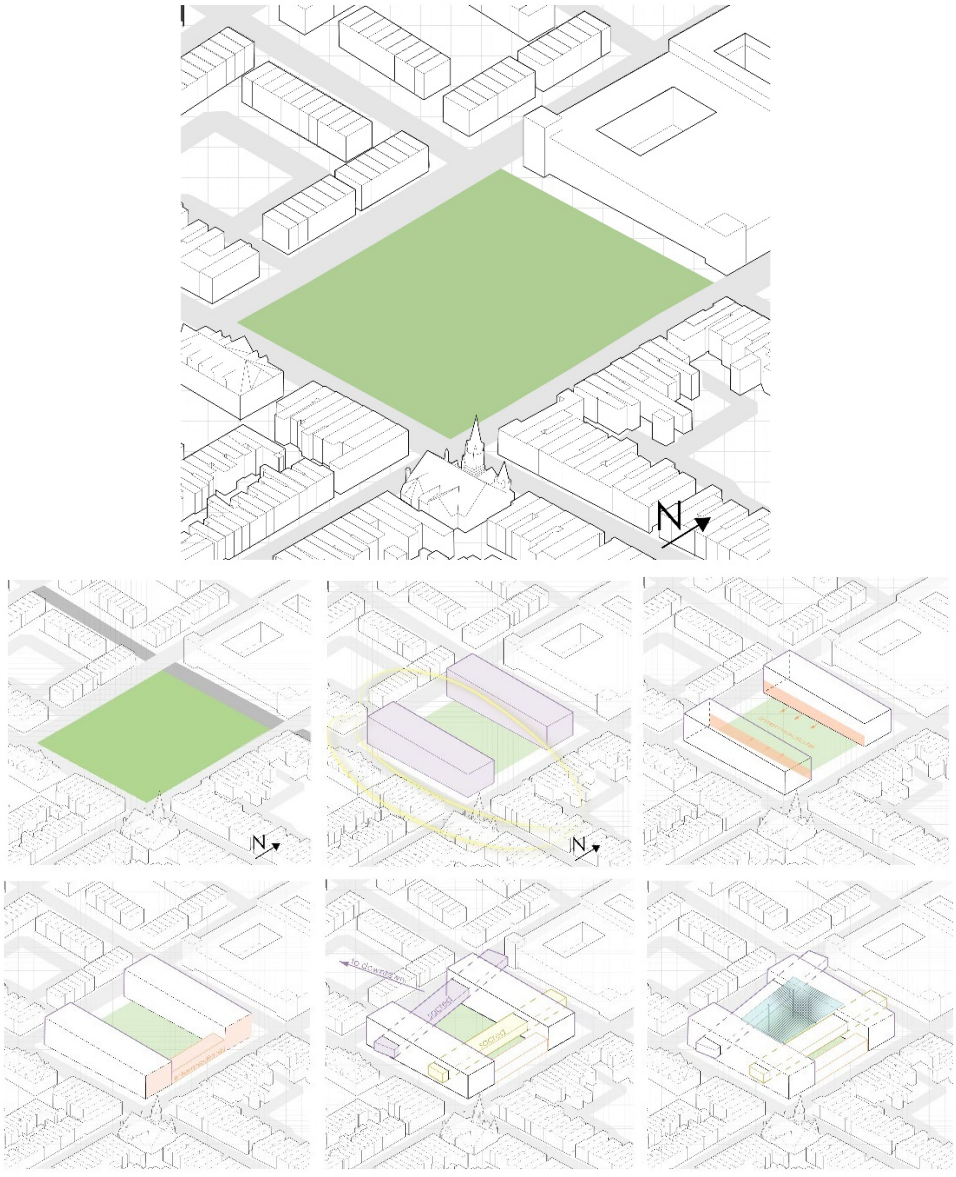


Figure 9-18: Parti Development - Strategy to Urban Context, Daylighting, and Spatial Zoning
(Image: author)

The design began at the urban scale. It looks at the negative urban response of the existing site as an opportunity to improve, and it stitches the street at the north end back into the urban fabric. It then lines the site on the north and south borders with the primary residential bars. This orientation went through numerous explorations, and even began as East/West orientation. The choice of the North/South organization is a response to the daylighting opportunity for residential units, as well as the reaction to the slope to the site. By lining the north and south slopes, the west end, the lowest and flattest point, can be utilized as a drop off region from which the housing entrance begins. Moving forward with the design, the drive to design spaces that are intermediate for the seniors and children to share versus the sacred zones specific to the children and seniors played a key role in the massing (refer to Figure 4-4: Symbiotic Relationship Dependent on Sacred Zones and Intermediate Zones). The next step of the parti introduced intermediate zones at the ground planes, using the central courtyard and the elevations that faced it as an opening into the first intermediate zone. The spaces beneath the residential bars were zones that were primarily used by seniors that invited in children. The east end was capped with another volume which would house the daycare and learning center primarily used by children. This space, in contrast, would welcome seniors to teach, learn, and play with the children in their intermediate zone. Finally, purely sacred zones for the seniors versus the children were created above these intermediate zones. To embody their independent presence, these zones become bridges that sever the residential bars and hover over the intermediate zones and courtyard, providing the opportunity for visual engagement while remaining in a personal space designated for each age cohort. The

final step to the parti development was enclosing the courtyard as a whole, maximizing the year-round use of the outdoor space by eliminating the threat of rain and snow in the space.

Design

Figure 9-19: Aerial View of Union Gardens Design
(Image: author)

The design is named the Union Gardens. The primary concept of indoor and outdoor intermediate zones is highly played up in the courtyard around community

gardens which can be used by the residents or children as teaching and engaging tools. The goal of the project is to bring people across generations together in a playful, educational, and organic setting. The design lends itself to various types of interactions, allowing seniors and children to actively participate and interact with others in spaces such as the courtyard, the classrooms, or the music, art, or exercise rooms. It also allows more passive engagement, such as a visual and perceptual interaction through observance such as in spaces like the atriums in the Learning Center or from separate terraces within the courtyard, or even from the sacred zones up above.

The facades of the building are meant to represent the architectural context in the vertical organization of the long south and north facades. The interior facades open into the courtyard while the exterior facades are inspired by the typical Baltimore rowhome as well as the newer industrial examples through the city, such as Union Wharf south of the site. The materials used include a pale gray brick layered in front and behind of a white aluminum paneling with black trim around window openings and glazed walls.

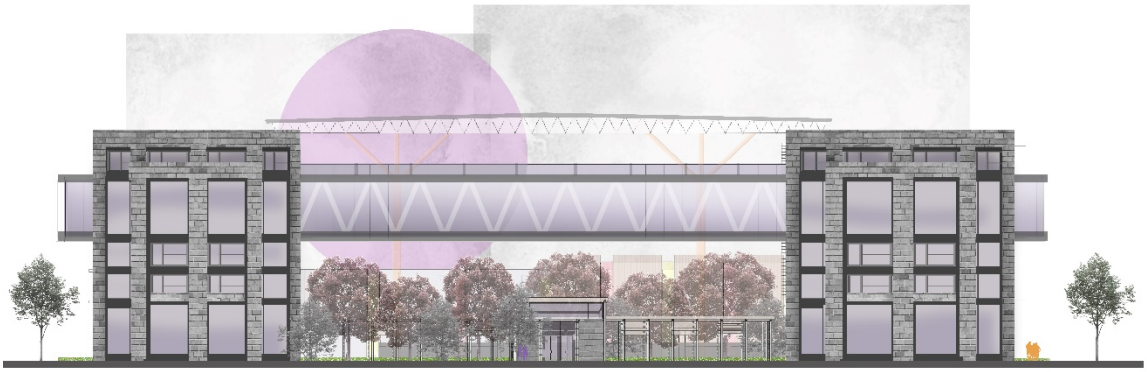


Figure 9-20: Elevation on N. Wolfe Street to Welcome House
(Image: author)

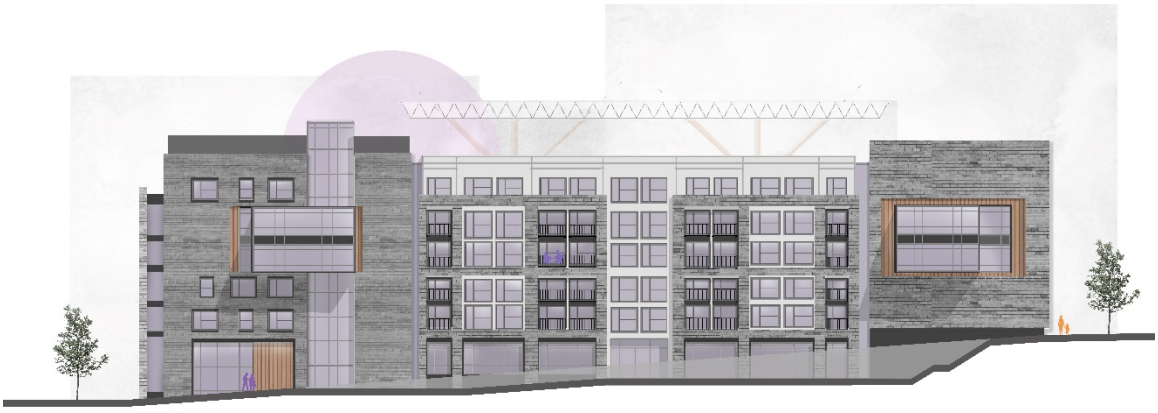


Figure 9-21: Elevation on E. Baltimore Street
(Image: author)

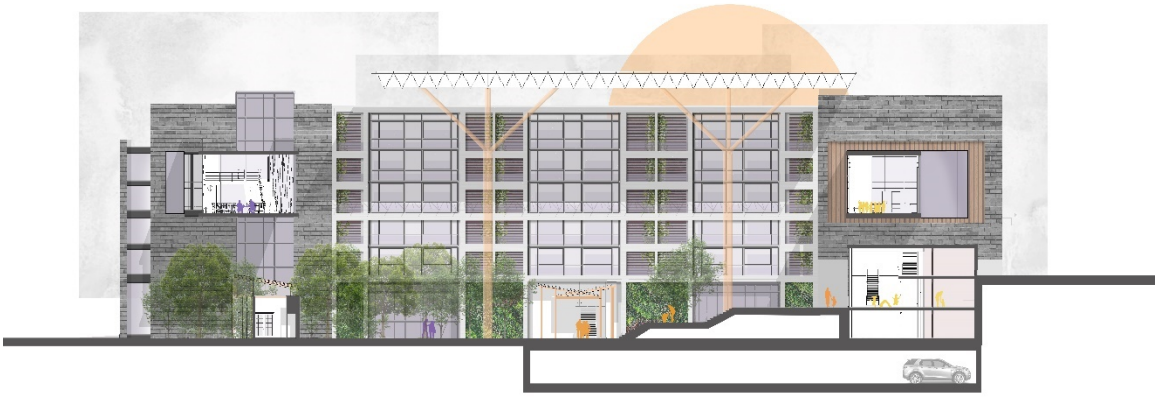


Figure 9-22: Interior Section Elevation
(Image: author)

The elevation of the Learning Center is unique in its playfulness. The materials of the learning pods change to a wooden cladding that only appears at the moments where the links pierce through the residential wings. At these penetrations, the pale gray brick peels back to reveal a wood cladding that bounds a window opening into the space within. Between the learning pods that line the east street are channels of colored glass in order to cast playful colored sunrays into the corridors of the Learning Center.

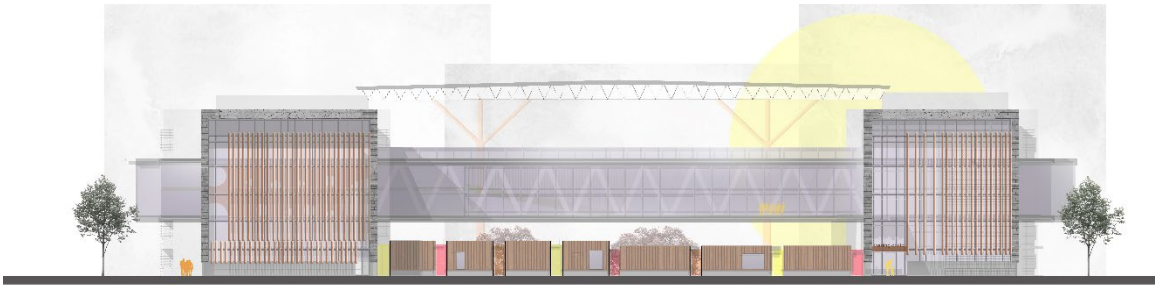


Figure 9-23: N. Washington Street Elevation to Learning Center
(Image: author)

Experience

Union Gardens is a project designed for two age groups- seniors who live and visit, and young children who spend their days in the daycare and learning center. The organization of the building is designed so that these two age cohorts have their own entrances to the building, as well as their own sacred zones or spaces. Altogether the building is a blend of community and independent space.

The following images depict floor plans and particular elements of the plans. Further depictions of the quality of these spaces will follow.

Figure 9-24: Ground Floor Plan @ 0’
(Image: author)

The seniors begin their journey through the building at the western border of the site, entering at the Welcome House at the low end of the site (refer to Figure 9-38: Senior Entry through Welcome House and view of Senior’s Sacred Link). They then proceed under a pergola towards the wing they live in and can either proceed up the stairs or the elevator in their lobby, or they can choose to enter the first intermediate zone: the courtyard and the spaces adjacent. Here, the programs that line the courtyard include rooms for music making and dancing, art rooms and makerspaces (refer to Figure 9-33: Makerspace, Intermediate Zone Adjacent to

Courtyard), exercise rooms, and a swimming pool. At the base of the Learning Center are flexible classrooms, spaces that seniors can visit and work with children, as well a cafeteria for daily use by the children.

The western edges of the wings are capped off with retail services, specifically zoned to be infilled by a grocery store or a co-op and a salon. These services can cater to the residents, and also offer the opportunity for seniors to work in during their stay.

The courtyard is designed with flexible zones as well as spaces that are specifically serving a function. A portion that ramps up from the ground level to the mezzanine level is a series of garden terraces, a zone that creates a learning opportunity for the children from the seniors. There are two open fields that can either host outdoor events or serve as places for children to run around and play sports in. There are meandering paths that wander the courtyard and lead up to the playground for children or the ground level entry to the Learning Center. A pergola stretches from one residential bar to the next along the centerline, acting as a shading device that extends to partially cover a paved patio immediately between the pergola and the larger field (refer to Figure 9-34: Courtyard Central Pergola between Residential Wings). The variety of spatial experiences in the courtyards allow for different types of interactions between the seniors, seniors and children, and seniors and visitors to the gardens.

Figure 9-25: Section Perspective through Courtyard
(Image: author)

Figure 9-26: Mezzanine Floor Plan @ 10'
(Image: author)

One level above the ground floor of the courtyard and the wings is a mezzanine level. This mezzanine is 10 feet above the ground floor, and 10 feet below Level 1. At this mezzanine level, there are spaces for the retail to expand into two floors. There is also a replication of the ground floor plan of the Learning Center with a large open space for flexible and collaborative learning at the base of the central staircase, as well as a a view into the double-heighted cafeteria below.

The spaces above the rooms around the courtyard boundary are accessible from the street level, providing a more street-friendly presence for the building. The façade on the North and South wings extends into a colonnade that creates a threshold into the building along the sloping facades. Visitors that aren't residents, for instance seniors who are interested in moving in, and pass through this threshold on the North side and enter the spaces of the employees at this level. On the south side, visitors may enter through this threshold into a small medical center that caters to the residents as well as the neighboring community. These are the only additional entry points into the building aside from the Welcome House and the Learning Center as to maximize security by minimizing opportunities for breaches.

Figure 9-27: First Floor Plan @ 20'
(Image: author)

At Level one is where the building meets the natural ground of the site at the East end. This becomes the natural entry for the Learning Center (refer to Figure 9-42: Entry to the Learning Center and visual of Children's Sacred Link), which is conveniently across the street from an elementary school and an early education center for new mothers and their young children. Along this floor in the Learning Center, children and visitors enter into the atrium. Above, they can see the sacred link of the children poking through the atrium, opening up into the space below (refer to Figure 9-35: Entry Atrium to Learning Center, featuring the staircase to Children's

Sacred Zone above and Cafe below). A long staircase brings the children into their private space, while the floor below is occupied by seating for visitors and parents as well as a café. The children and visitors can then pass the front desk down the corridor into the classroom spaces. Here they will enter a large space outside the small flexible classrooms that border the street edge. These classrooms can host a variety of activities and can serve as spaces for seniors to engage with the children in a playful teaching environment. All of these classrooms open up into the collaborative learning space that is centered around a central colorful staircase (refer to Figure 9-36: Corridor in the Learning Center overlooking Mezzanine Level of the Courtyard). The floor below opens up onto the terrace for the children's playground, right outside the mezzanine floor.

Further down the corridor of the Learning Center, rooms suddenly flank the right and left side as it transitions from a single loaded to a double loaded corridor. In this section of the building begins the offices of the caretakers and smaller care/play rooms for the children to utilize within view and sound of their caretakers. At the end of this corridor is another grand atrium. This atrium hosts an event/gallery space for seniors and children to once more cross paths, this time is a more passive and observant way. Children also have the opportunity to observe from above from their sacred link (refer to Figure 9-37: Catwalk above Gallery Atrium, Emerging from the Child's Sacred Zone).

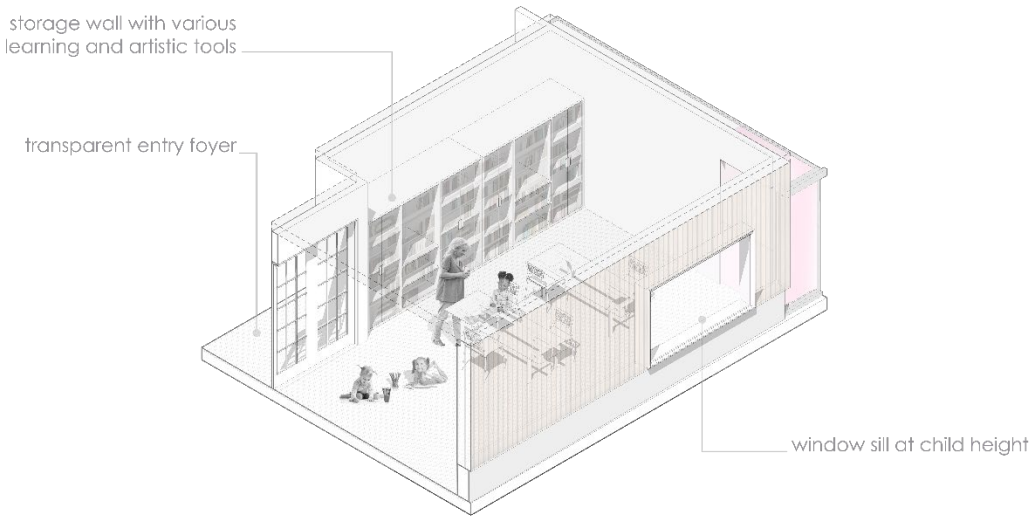


Figure 9-28: Flexible Classroom as an Intermediate Zone
(Image: author)

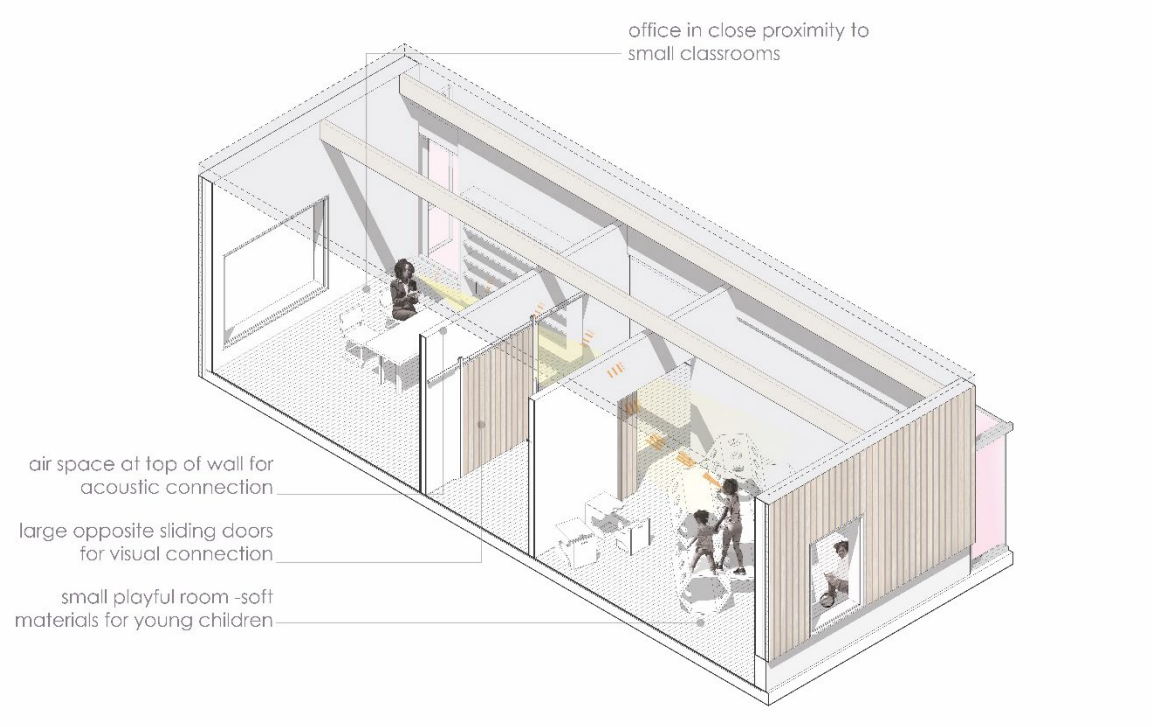


Figure 9-29: Office and Play Room Configuration
(Image: author)

In the residential wings begins the units. Residents emerge from the stairs or the elevator into a lobby space with seating and mailboxes. They proceed to one of the four types of units this housing provides: one bedroom unit, two bedrooms, three

beds, or four. The larger units are at the western end of the wings, looking out towards the Inner Harbor. The two bedroom units are along the single loaded corridor that has large operable windows to open up into the courtyard (refer to Figure 9-39: Senior Resident Hallway Approaching the Sacred Link). Both the single loaded and double loaded corridors of the senior wings have lightwells that carry through the floors. These lightwells have biophilic walls to allow a perpetual engagement with natural elements through the resident's journey in their building.

The goal of the variety of units to provide a familiar sense of home the residents may have carried from their previous homes. The homes, while efficient in size, have plenty of space for storage and small kitchens that give them the option to take a meal at home rather than in the community dining hall. Residents have the option to live with others or slowly transition from their own private space to sharing experiences with their neighbors.

Figure 9-30: One Bed Unit Module
(Image: author)

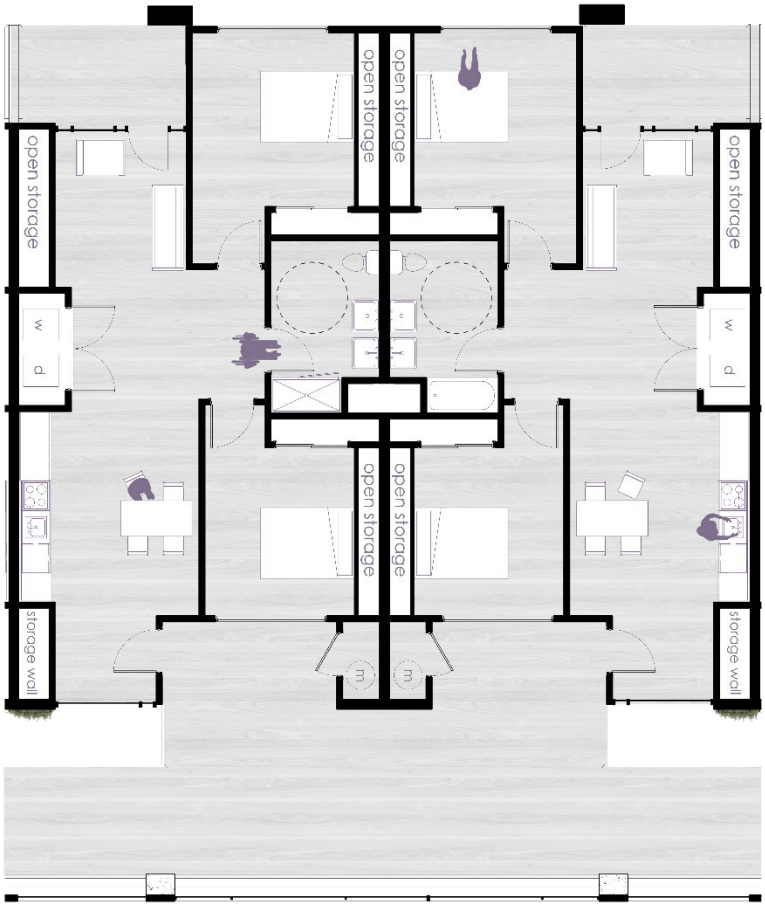


Figure 9-31: Two Bed Unit Module
(Image: author)

Figure 9-32: Third Floor Plan @ 30'
(Image: author)

The sacred links cross through the residential bars at level three and occupy two stories of height. At these two levels, the corner units are replaced with large social lounges that provide a personal library for the residents. The link itself on the senior side is a large dining hall that might convert to community space for various events such as game nights or dance nights (refer to Figure 9-40: Within the Senior's Sacred Link: Dining Hall). The south end of the link is filled with the services for the dining hall, while the fourth floor southern end has private dining rooms that might be rented out for personal events of the seniors.

The sacred link of the children begins as a double heighted space at the entry atrium. Nearly halfway through the bridge, children will encounter the Climbing Library, a series of steps that house shelves of books. The Climbing Library is a playful take on a children's library and reminds children that learning can be fun (refer to Figure 9-41: Within the Children's Sacred Link: Climbing Library).

Beyond the stairs the link has two stories, both of which have smaller learning nooks for the children to gather, read, and learn with each other. On the third floor, the children have the opportunity to break free of their sacred zone and walk around the catwalk above the gallery atrium. This gives them a chance to be a passive observer of the activity below, or simply peer through child sized openings along the wall.

Intermediate Zones

The following series of images walks through the shared experiences of a senior resident and a child in the daycare program. The spaces shown include rooms off the courtyard, for instance the makerspace that is one of four primary spaces that invites young children to join the activities within. The images also depict the spaces within the courtyard, as well as the first floor of the Learning Center where children might interact with seniors either actively or passively.

Figure 9-33: Makerspace, Intermediate Zone Adjacent to Courtyard
(Image: author)

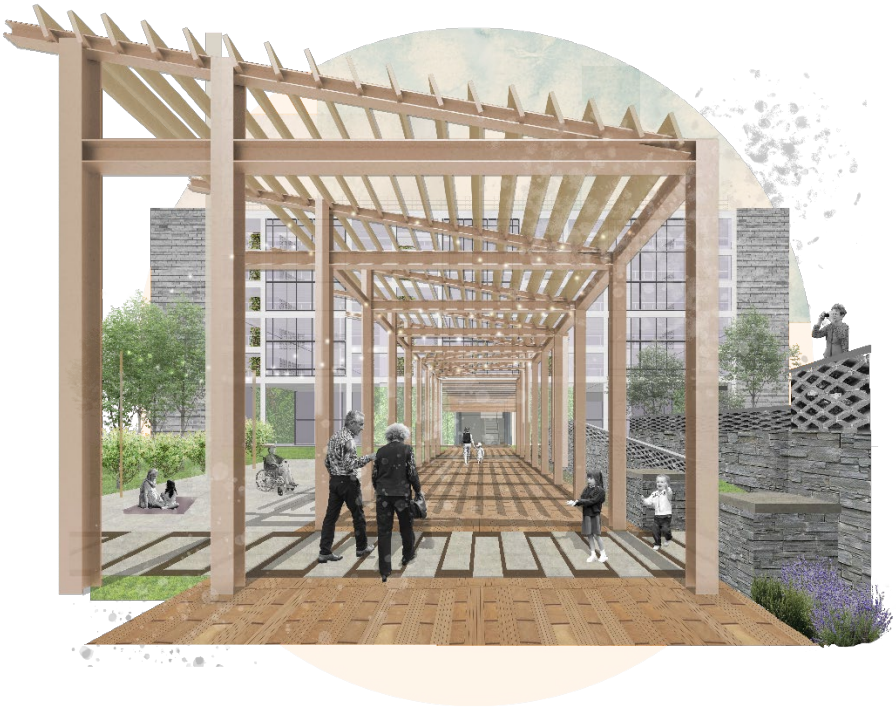


Figure 9-34: Courtyard Central Pergola between Residential Wings
(Image: author)

Figure 9-35: Entry Atrium to Learning Center, featuring the staircase to Children's Sacred Zone above and Cafe below
(Image: author)

Figure 9-36: Corridor in the Learning Center overlooking Mezzanine Level of the Courtyard
(Image: author)

Figure 9-37: Catwalk above Gallery Atrium, Emerging from the Child's Sacred Zone
(Image: author)

Sacred Zones

The following series of images walks through the individual experiences of each age cohort including the entry points for each program within the building.

Figure 9-38: Senior Entry through Welcome House and view of Senior's Sacred Link
(Image: author)

Figure 9-39: Senior Resident Hallway Approaching the Sacred Link
(Image: author)

Figure 9-40: Within the Senior's Sacred Link: Dining Hall
(Image: author)

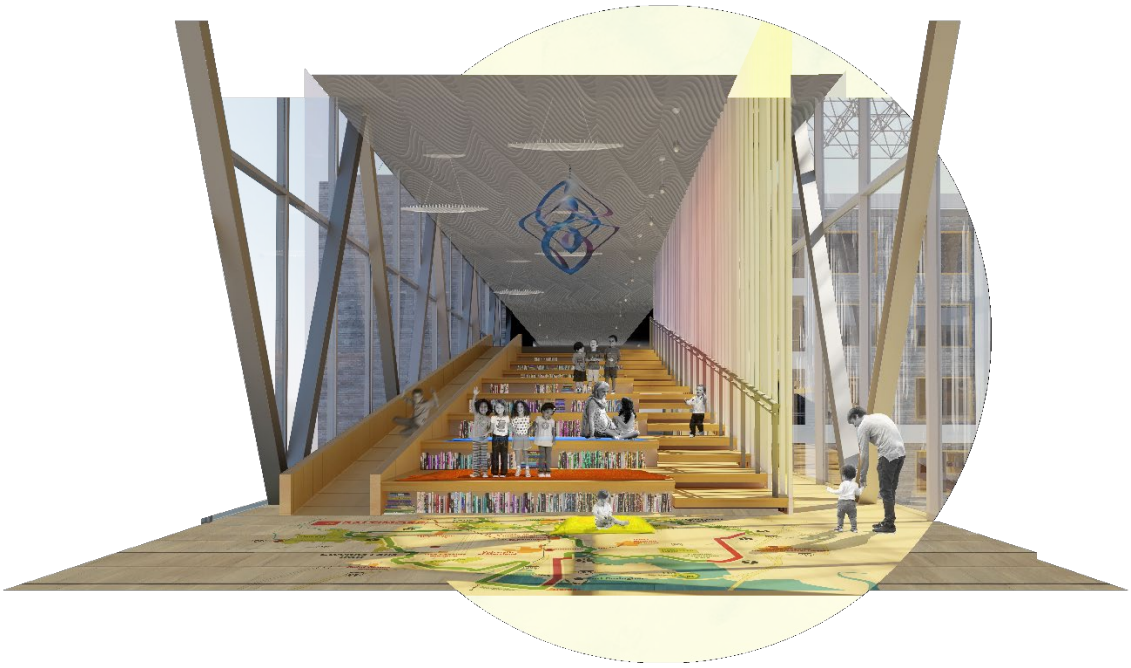


Figure 9-41: Within the Children's Sacred Link: Climbing Library
(Image: author)

Figure 9-42: Entry to the Learning Center and visual of Children's Sacred Link (Image: author)

Chapter 10: **CONCLUSION**

Intergenerational architecture is in no way a revolutionary idea. To the contrary, cultures around the world have integrated seniors into the routine of everyday through architecture and general ways of life. In many Asian cultures, seniors live with their younger families. In Rome, you might find a senior living housing next to a daycare by luck of urban planning. In tribal cultures, the eldest members of society become the voice of wisdom and law and dictate the ways of life for others.

Intergenerational ways of living and designing are not new; they are ancient, and they prevent a cycle of ageist assumptions from burdening society. Unfortunately, with the rapid development of technology in the 21st century, it's easy for aging adults to fall behind the trends and ways of speaking, communicating, and moving with society. It's essential to recognize that aging doesn't mean we lose the ability to do these things, and aging can be a wonderful part of our lives that is filled with energy, creativity, and activity. Design that caters to our older generations must recognize these realities, and it must aim to push the boundaries of what senior living looks like. While we can aim to design senior living as enthusiastically as we design any regular multi-family housing, we can aim to break down that barriers that might otherwise hinder seniors to keeping up with the ever-evolving trends in society.

Aging doesn't need to produce barriers, and successful design and architecture can make sure that our experiences in our old age are as lively and engaging as they were in our younger age. Integrating young and old can be the first step to rewriting the narrative of aging, allowing us to look forward to new opportunities in older age

rather than fear the unknown. The design of Union Gardens and the Learning Center are just one way to address how to integrate multiple generations. Naturally, numerous permutations of integration are possible: seniors might integrate with college students, or the housing might offer living accommodations for families or young adults. The building could be broken up into several buildings that occupy a single block, similar to what might be seen in Rome. This project is just a predecessor for the direction that senior living might begin to shift throughout America. Successful design of senior living can transcend the standard of a senior's lifestyle and rewrite the narrative of what it means to age.

Figure 10-1: Final Presentation Boards
(Image: author)

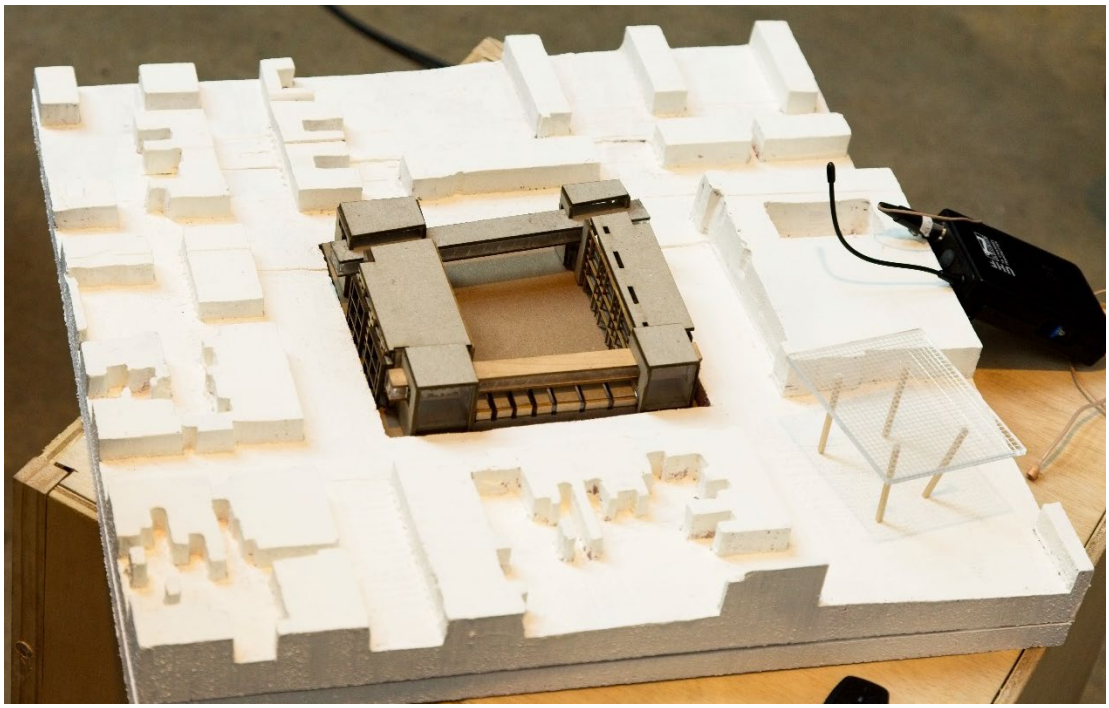


Figure 10-2: Final Model of Union Gardens and Learning Center
(Image: author)

Figure 10-3: Final Model Close Up
(Image: author)

APPENDIX A: CODES AND SPATIAL GUIDELINES

The following images are taken from text and sources online to demonstrate important codes and spatial guidelines to consider when designing for accessibility and aging.

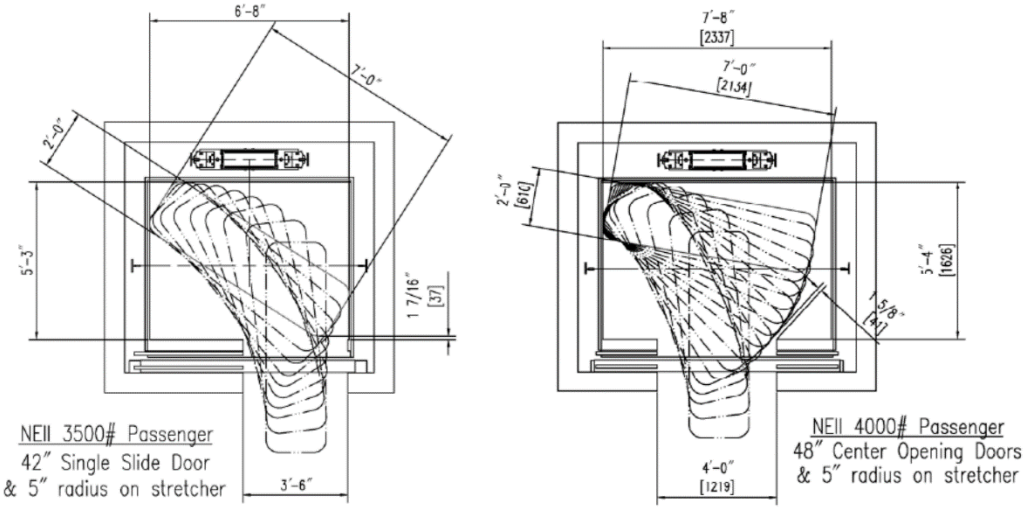


Figure 0-1: IBC Guidelines to Elevator Design that Incorporates the Size of a Stretcher
(Image source: NYC Buildings Bulletin, from 2009 IBC Commentary)

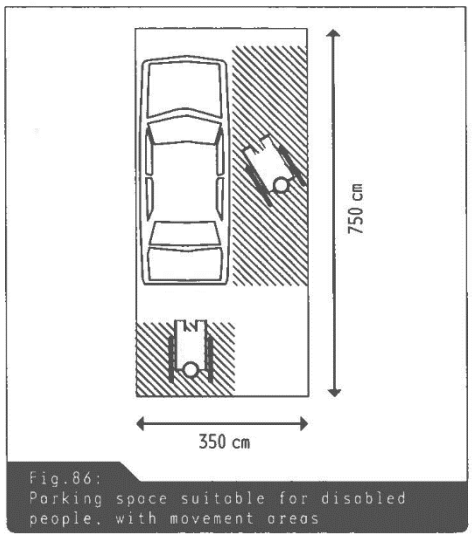


Figure 0-2: Accessible Parking Space Dimensions
Image source: (Skiba and Zuger)

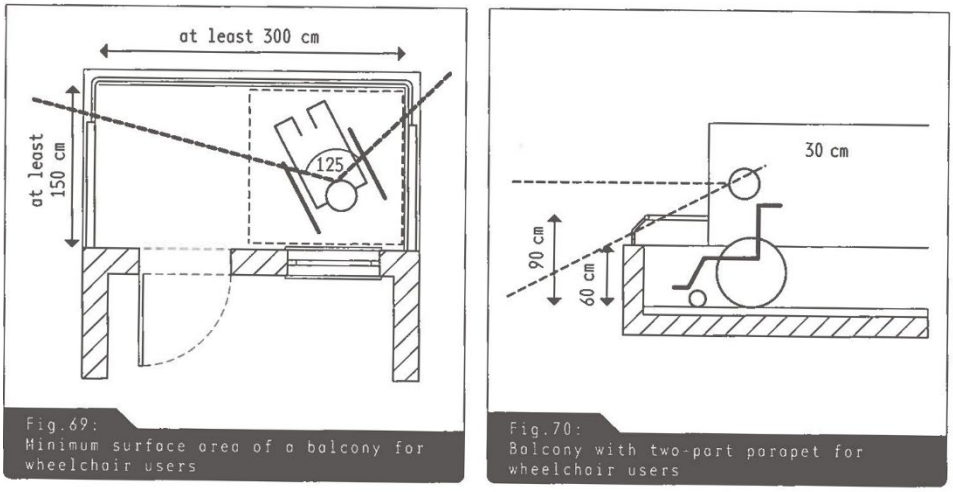


Figure 0-3: Accessible Balcony Dimensions
Image source: (Skiba and Zuger)

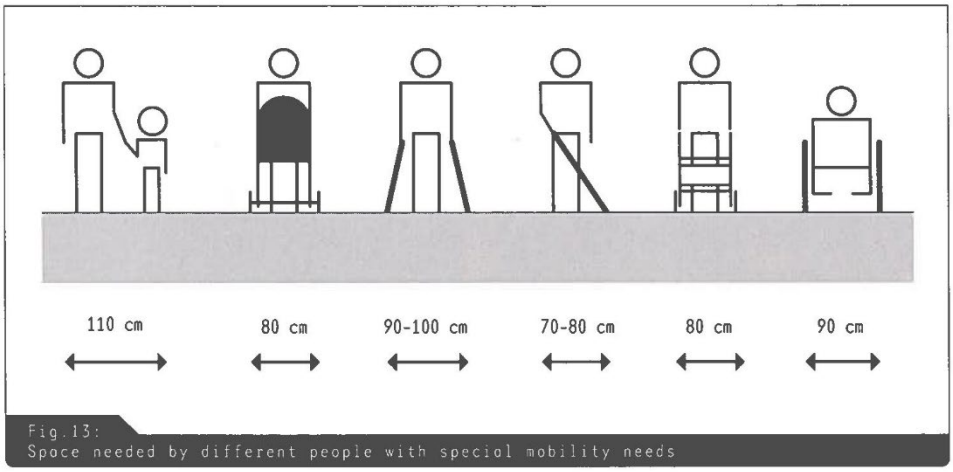


Figure 0-4: Consider Accessibility of All Needs
Image source: (Skiba and Zuger)

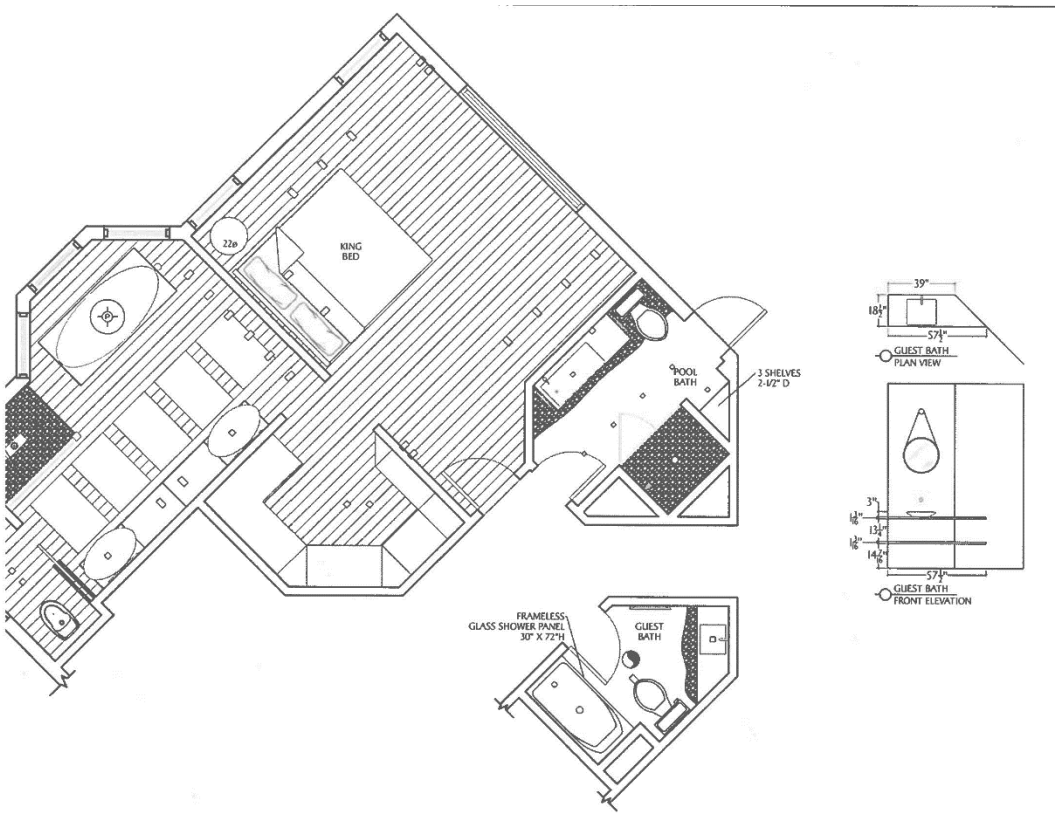


Figure 0-5: Demonstration of Layout of Accessible Unit
Image source: (Thomas and Lawlor)

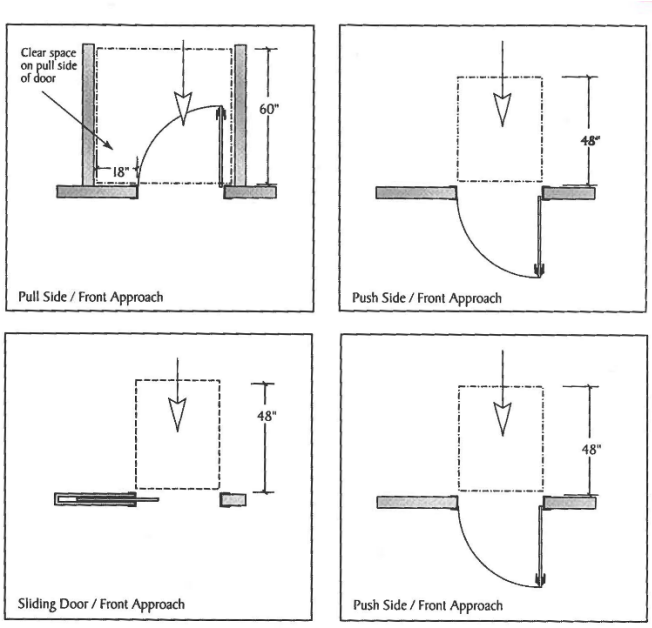


Figure 0-6: Accessible Entryways
Image source: (Thomas and Lawlor)

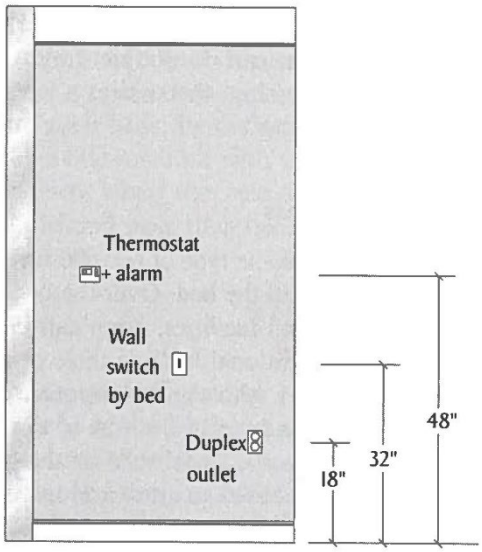


Figure 0-7: Accessible Features on Wall
Image source: (Thomas and Lawlor)

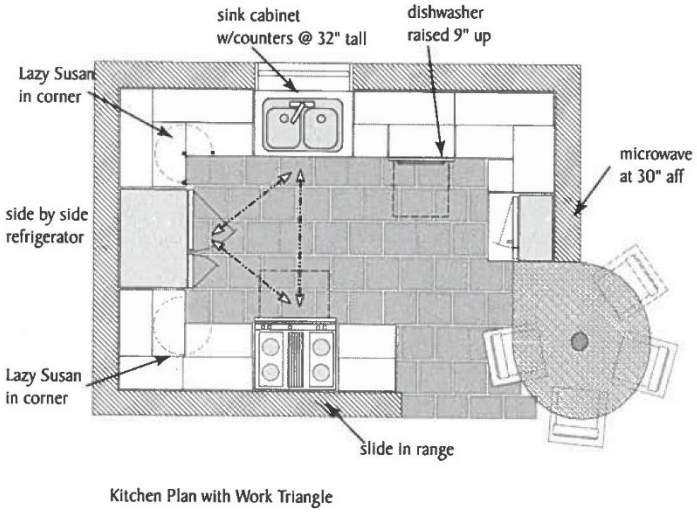


Figure 0-8: Accessible Kitchen Dimensions- Plan
Image source: (Thomas and Lawlor)

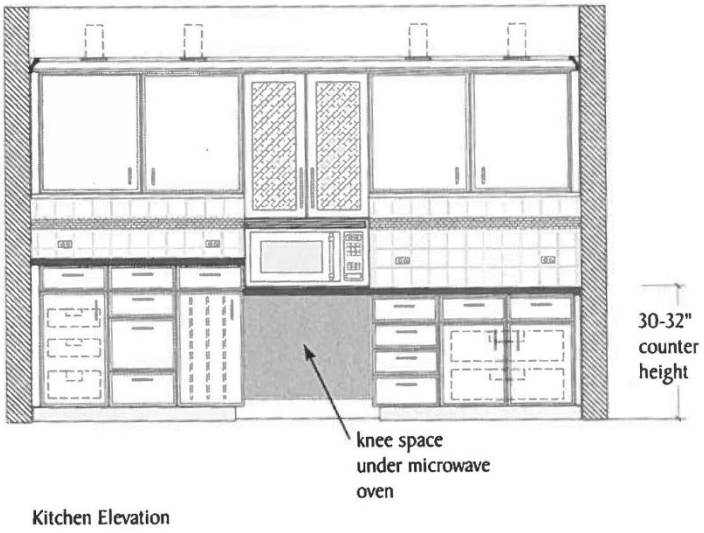


Figure 0-9: Accessible Kitchen Dimensions- Elevation
Image source: (Thomas and Lawlor)

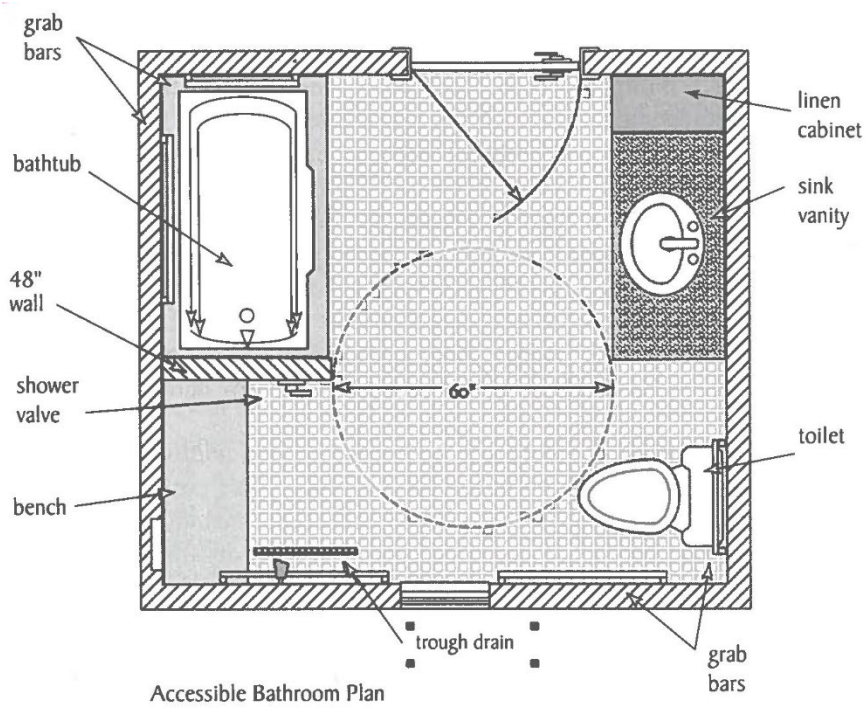


Figure 0-10: Accessible Bathroom Dimensions – Plan
Image source: (Thomas and Lawlor)

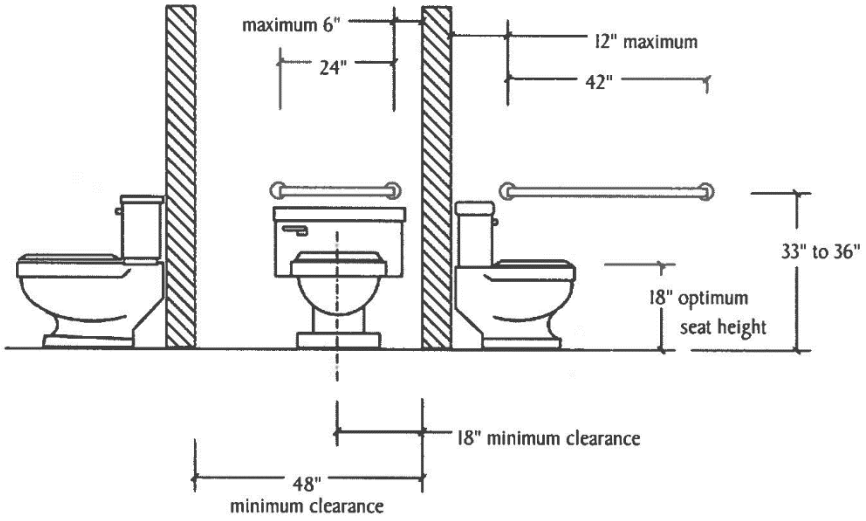


Figure 0-11: Accessible Bathroom Dimensions – Elevation
Image source: (Thomas and Lawlor)

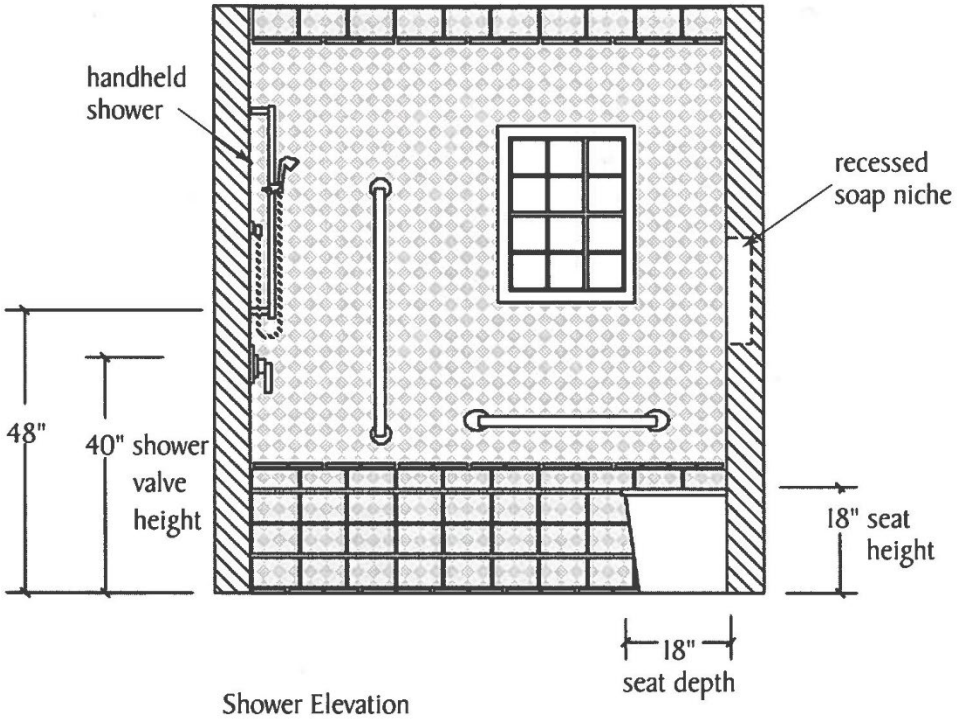


Figure 0-12: Accessible Shower Elevation
Image source: (Thomas and Lawlor)

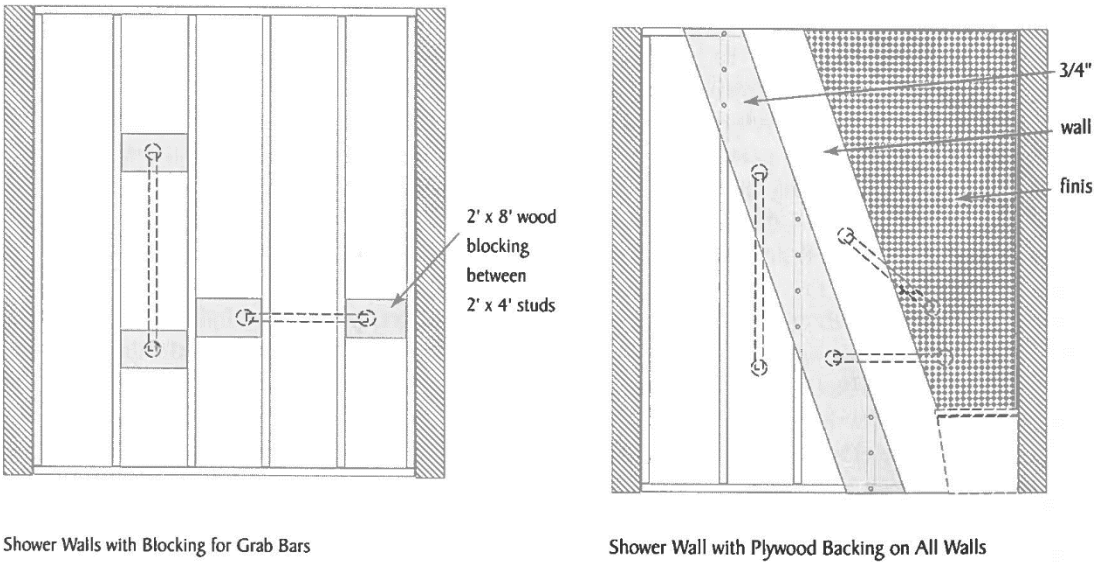


Figure 0-13: Accessible Shower Elevations and Construction
Image source: (Thomas and Lawlor)

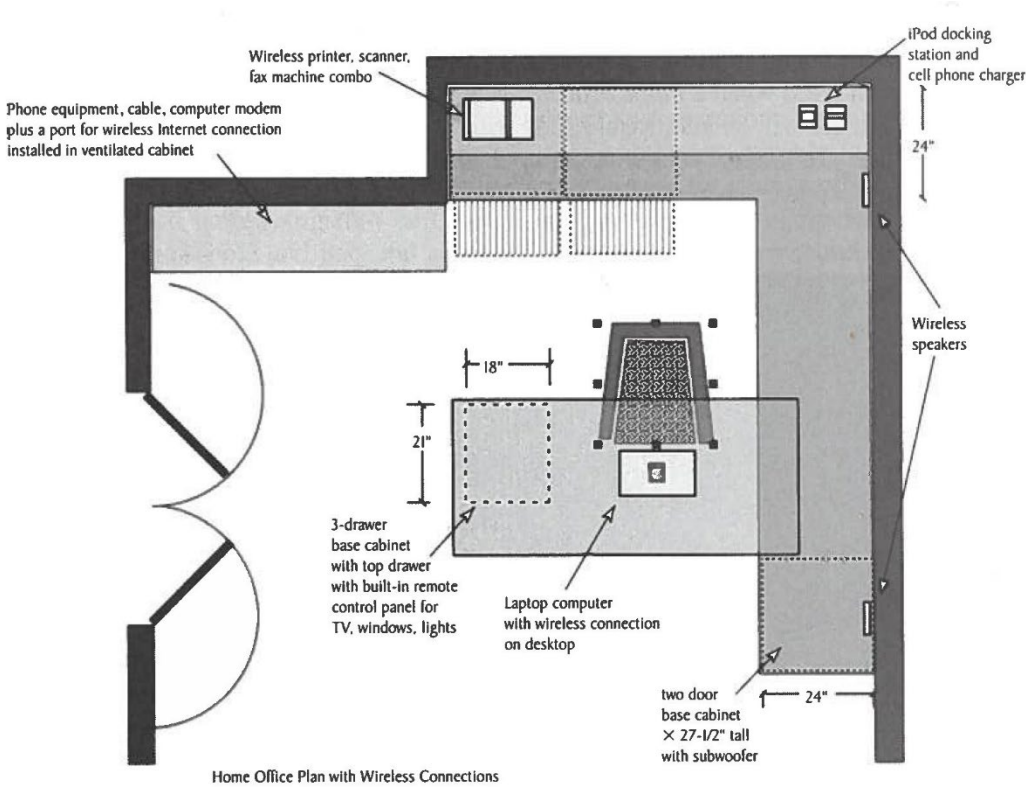


Figure 0-14: Accessible Home Design
Image source: (Thomas and Lawlor)

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