

Putting the Family back in Multi-family:
Reconnecting Urban Density and Family Housing in North Seattle

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Abstract

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As Seattle has densified, the rapid growth of housing has been focused primarily on units suited for individuals rather than units suited for families. In many cases, family-oriented units have been converted to single-occupancy units, creating a problematic spatial infrastructure that will hamper the ability of young, single newcomers to remain in the city if and when they decide to start families and raise children. The divorce between density and family housing must be addressed as Seattle continues to grow, and it must go beyond simply adding more bedrooms to bigger units. This thesis explores the physical, social, and cultural amenities of single-family housing and the needs of families with children living in cities to propose a hybrid approach to high-density family housing that fosters the life of families in the city. Using the North Seattle neighborhood of Aurora-Licton Springs as a ground for inquiry, this thesis imagines a denser Seattle that supports families with children and allows them to be integrated into the urban environment.



**Putting the family back in multi-family:
Reconnecting urban density and family housing in North Seattle**

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My friends and family

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INTRODUCTION

With a rapidly growing population resulting in an escalating housing shortage, increased density is desperately needed in Seattle. While housing units are being added across the city to absorb this increasing demand, the development underway is highly selective in both location and intended occupants. Spatially, the new development is clustered on a small percentage of the city's developable area, and programmatically, most of it is geared toward individual-occupancy, or couple occupancy at best, with an emphasis on single bedrooms, studios, and single-efficiency dwelling units. Additionally, in practice, current development often manifests in the replacement of housing units well-suited for families, typically in the form of single-family detached houses (SFDH), with one bedrooms, studios, and single-efficiency-dwelling units. This is particularly troublesome in more traditionally family-oriented neighborhoods where the removal of family-sized housing has become a rallying cry for those opposing any and all density increases.

As Seattle continues to grow, it is critical that the development of higher-density housing is expanded to larger

swaths of the city; the preservation of large reserves of single-family detached houses (SFDH) throughout much of the city is no longer a viable pattern of development. Simultaneously, the transformation of housing units well-suited for families into high-density units for the individual is problematic for the long-term health of the city. What happens when the young singles currently residing in studios and single-efficiency dwelling units, those responsible for much of Seattle's population growth, decide to marry and have children? Is Seattle building a spatial infrastructure so focused on the needs of today that it precludes the needs for tomorrow? With decreasing options available for families, particularly those with children, as Seattle continues to densify, the city is creating a spatial infrastructure that will hamper the ability of children to grow and thrive in place. A new solution that allows families to occupy higher-density cities is needed, one that goes beyond simply adding more bedrooms to bigger units.

This thesis will explore two major architectural issues at play. First is the programmatic element of high-density housing designed for families, and second is the spatial distribution

of high-density housing in Seattle. Currently, Seattle's development pattern divorces these two concepts; high-density housing, as it is currently being realized, is predominantly ill-suited for families and is only distributed in select areas of the city. Conversely, much of the city is comprised of housing well-suited to families, but the low density of this housing creates a severe lack of inventory. This dichotomy is evident in the often vocal neighborhood opposition, or at least outcry, that accompanies the destruction of SFDHs for large apartment and mixed-used developments

With the above issues in mind, this thesis proposes that architecture can provide a solution to these problems by creating higher-density family housing that fulfills the physical, social, and cultural needs of families and children. Rather than "shoe boxes in the sky", this project seeks to create homes that provide humane spaces for families, allowing them to thrive and grow while simultaneously fostering community identity and a sense of home, "homing" families instead of simply housing them. It seeks to offer an alternative option to the culturally-assumed family-to-suburb pipeline while allowing families to

take advantage of the benefits of urban density. Research into the current demographic and development trends in Seattle will clarify the issue while analysis of the physical and socio-cultural aspects of SFDH will provide a deeper understanding of the amenities that underlie the connection between families and their homes. Research into the needs of families and children in vertical communities will illumine the particular considerations necessary for this demographic group living in high-density housing, followed by an analysis of two case studies of high-density family housing. Using the vision plan for an extended high-capacity transit system released by Seattle Subway as a framework to imagine a denser city, this project addresses both Seattle's growing need for density outside the downtown core while similarly addressing neighborhood concerns about the appropriation and transformation of family housing. Thus, this thesis proposes a multi-story residential tower in the Aurora-Licton Springs Urban Village that will provide a viable alternative for family housing beyond the SFDH by hybridizing the amenities of the single-family detached home with the spatial configurations of higher density housing.

CHAPTER 2: FRAMING THE ISSUE

2.1 - What Constitutes a Family?

At the outset, it is important to define what constitutes a family for the purposes of this proposal. According to the US Census, a family is defined as “any two or more people (not necessarily including a householder) residing together, and related by birth, marriage, or adoption” (US Census). This thesis adapts the above definition through the lens of children to specifically define a “family” as “one or more adults plus one or more children residing together, related by birth or adoption.” This definition reflects the understanding that the amenities and spatial needs of a family with children will be beneficial to other living arrangements beyond the nuclear family. Thus, this investigation addresses the housing needs of the myriad arrangements that can make up a family or household, be it a childless couple taking care of aging parents, a young adult living back with their parents after college, grandparents taking care of the grandkids, or even a group of friends and roommates. Conversely, families without children can be better served by current development trends than those with

children since a married couple can certainly manage more easily in a one-bedroom than one or two parents with a child.

Another important factor for including children in the definition is the strong cultural association of the SFDH with child-rearing in contrast to the view of the city as “playgrounds for adults”(Renn). Kaid Benfield notes that, “families with kids are the traditional market for the sprawling suburban subdivision” while according to Aaron Renn, “today, cities are increasingly no longer seen as a locus of family life and child rearing, but rather an ‘entertainment machine’ for adults.” While this dichotomy is not the focus of this thesis, it is important to consider this issue because, as Benfield continues, “what happens when these 20-to35-year-olds outgrow their one-bedroom condos? Is it good for the city to lose them to the suburbs?” Although the movement of families to the suburbs is not inherently problematic, Renn observes:

“there’s nothing wrong with urban centers playing [the] role as a playground for adults and as a production node in the creative class economy – as long as you recognize the limits that implies... but a city without children has no future. To the extent

that central cities outsource the rearing of future generations to the suburbs or foreign countries, they cannot plausibly serve as a general-purpose model.”

If Seattle is to retain the large numbers of single, young adults flocking to the city rather than having them relocate to neighboring suburbs, it needs to provide a spatial infrastructure that can accommodate them as they begin to marry, form families, and raise children.

2.2 - Benefits of Families in the City

In addition to allowing families to remain in the city rather than merely being treated as a stop on the path of young adulthood, cities benefit from the inclusion of families and children in urban life. As the city of Toronto notes in their guidelines for accommodating families with children in vertical communities:

“large units and family-oriented buildings and neighborhoods contribute to a diverse, thriving

society. Families who chose to live in vertical communities may sacrifice household space for greater convenience to work and amenities, as well as more quality family time. The outcome is a benefit to Toronto in that well-designed vertical communities become desirable and help to keep a diverse population in the city. When children and youth live in the city, it supports private and public investments in community facilities, schools and parks which are all foundational to a healthy city.”
(City of Toronto)

Benfield also hints at the importance of the diversity children bring to cities by asking, “in our rush to promote higher-density urbanism, are we inadvertently creating child-free zones that are inhospitable to families with kids? And, if so, are we diminishing part of the cultural diversity that makes great cities?” The lack of children in cities has further implications as well, as Renn explains: “these global cities are where the culture is made, where the media are, etc. To the extent that they represent a very atypical demographic profile that largely excludes families with school-aged children, this only perpetuates the ‘bubble’ in which America’s leadership class often lives.” Finally, the societal implication of the link between families and urban living is further explored by

Benfield: “If we expect cities to be part of the answer to the problem of climate change, the financial unsustainability of sprawl, or anything else, then it has to be a place where children can be raised to thrive in the world.” Thus, designing the built environment for families with children, both at the city and building scale, offers to elevate the quality of life across a broad spectrum of residents and society in general, not just those with children.

2.3 - Seattle Family Demographics

Based on census data from 2010, Seattle ranked second with the lowest percentage of children as part of the total population for cities over 300,000 people, just behind San Francisco, at 15.4% and 13.4% respectively (Benfield). Comparatively, the national share of children was approximately 25.7% while King County had 22.5% (US Census). As of 2016, it is estimated that approximately 15.2% of Seattle’s population is comprised of children under 18, compared to 20.8% for King County and 23% for the nation,

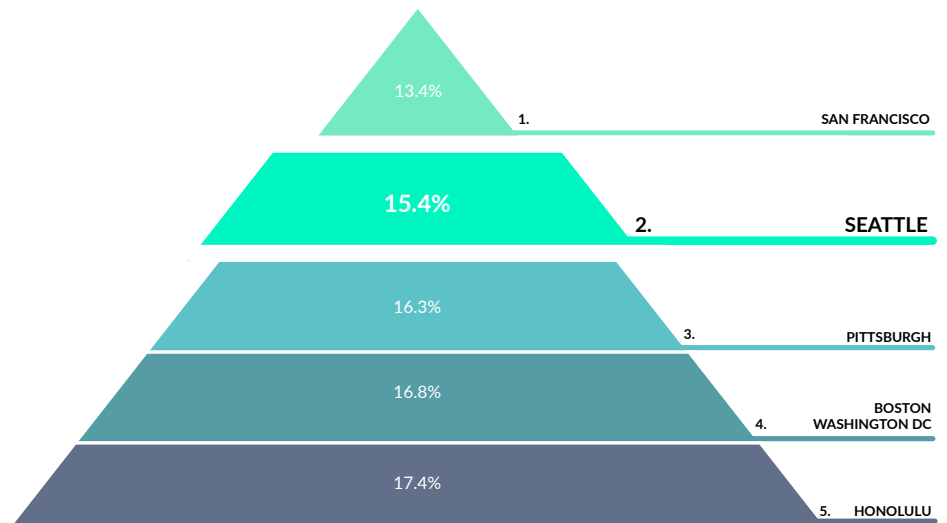


Figure 1 - US cities with the lowest percentages of children
 Diagram: Brad Valtman
 Data Source: Benfield

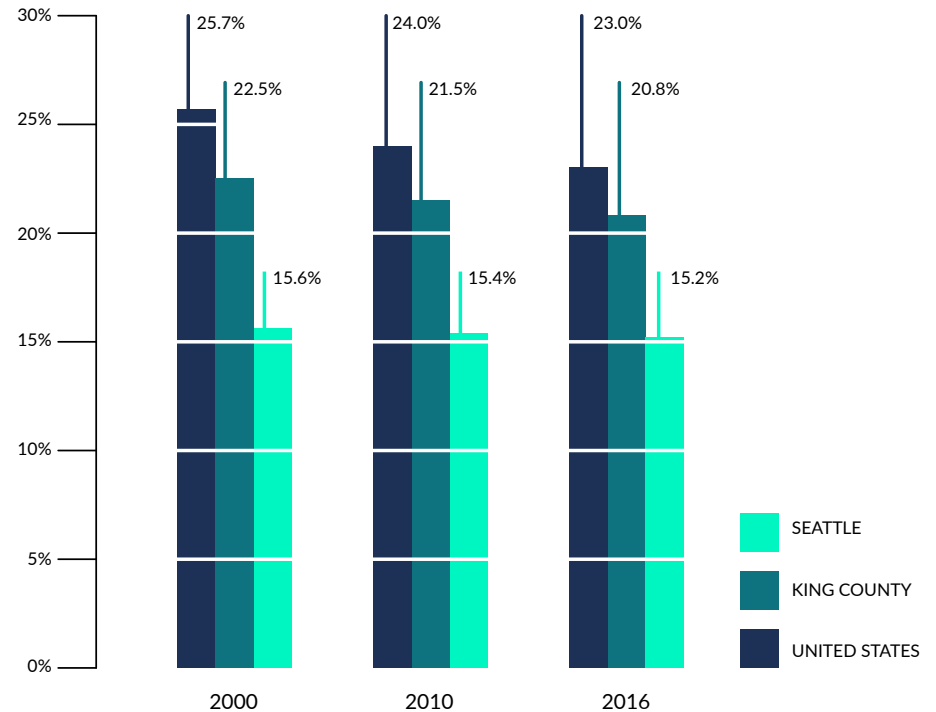


Figure 2 - Comparison of children population percentage
 Diagram: Brad Valtman
 Data Source: US Census

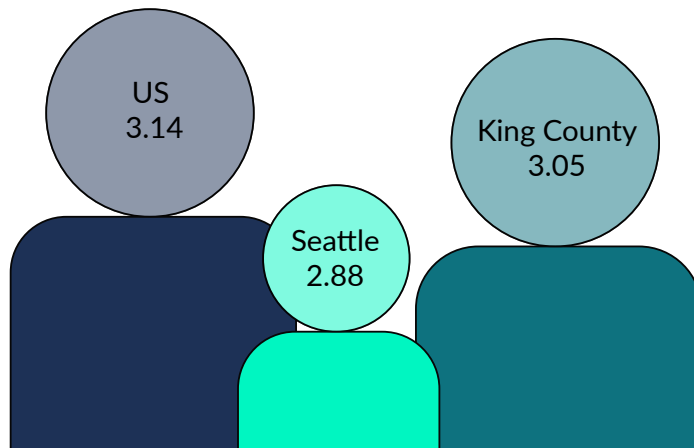


Figure 3 - Comparison of average family size in 2010
 Diagram: Brad Valtman
 Data Source: US Census

as highlighted in figure 2. Family size trends mirror the trends in the population percentage of children; in 2010 Seattle's average family size was 2.88, while King County and the US had average family sizes of 3.05 and 3.14 respectively, as shown in figure 3. These numbers have remained fairly stable, as well, with only King County's family size changing since 2000, increasing from 3.03(US Census).

This data shows a few interesting points, as highlighted in the figures 2,3 and 4. When comparing the percentage of children as part of the population between King County and Seattle (figure 2), it becomes clear that Seattle is currently outsourcing much of its child-rearing to the surrounding suburbs in King County. However, both areas are lower than

the national average, highlighting the high influx of the young, the single, and the childless to the Seattle region as drivers of the region's population growth rather than locally-driven increases. The outsourcing of childrearing is also evident when comparing the average family sizes, particularly given the increase in family size in King County since 2000 (figure 3). This suggests that families with children have been moving into the suburbs, either directly from Seattle or bypassing it altogether. These statistics also highlights the low number of children in the region generally when compared to the national average.

Despite the fact King County remains a prime location for families with children, the percentage of children as part of the population is declining here, similar to trends seen nationally and locally in Seattle. However, the rate of decrease is much slower in Seattle than either King County or nationally (figure 2). As figure 4 shows, the percentage of children in Seattle has been hovering around 15.3% since 2009 while the percentage has decreased by 2.7% and 1.3% nationally and in King County respectively, figure 2. Additionally, while

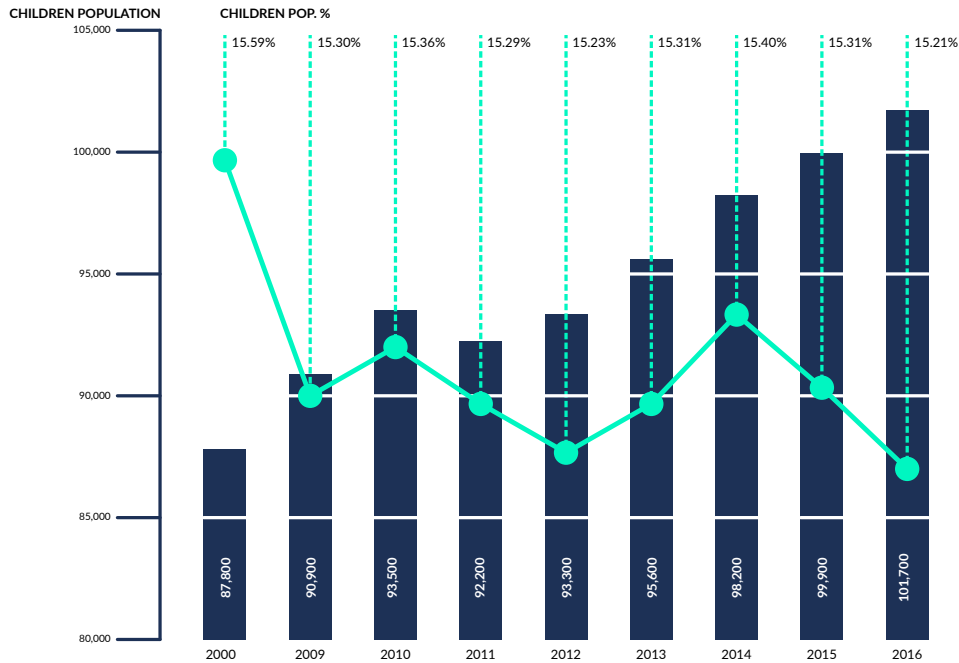


Figure 4 - Comparison children population percentage and total number of children in Seattle
 Diagram: Brad Valtman
 Data Source: US Census

the percentage of children has been decreasing in Seattle since 2000, the number of children has been steadily growing, though the explosive population growth of young singles has obscured this fact within the overall data, figure 4. This shows that Seattle is a desired place for families to raise their children and adds urgency to the need to develop housing units suitable for them to allow them to remain. The census data shows families with children are already here, and if they are not considered as Seattle continues to develop, they will

be forced from the city due to a lack of spatial infrastructure to support their evolving spatial needs.

2.4 - Seattle Housing Development

In addition to exploring the demographics of families and children, it is important to examine the current state of housing development in Seattle. While it is clear that Seattle has been building large numbers of housing units over the past few years, most of these units are not designed to house families. 52% of the units built between 2012 and 2017 have been single bedrooms, while an additional 29% of units have been studios. Further, only 17.5% have been two bedrooms and just of 1% have been 3-bedroom units (Lloyd). As Sarah Lloyd points out, “With more than 80% of new construction catering to people living along or, at best, couples, where does that leave everyone else – people with families they care for or people they prefer to stay with?”. Even San Francisco, the poster child of the housing shortage, is building both more 2-bedroom and 3-bedroom units compared to Seattle,

2012-2017
 CONSTRUCTED MULTI-FAMILY UNIT MIX

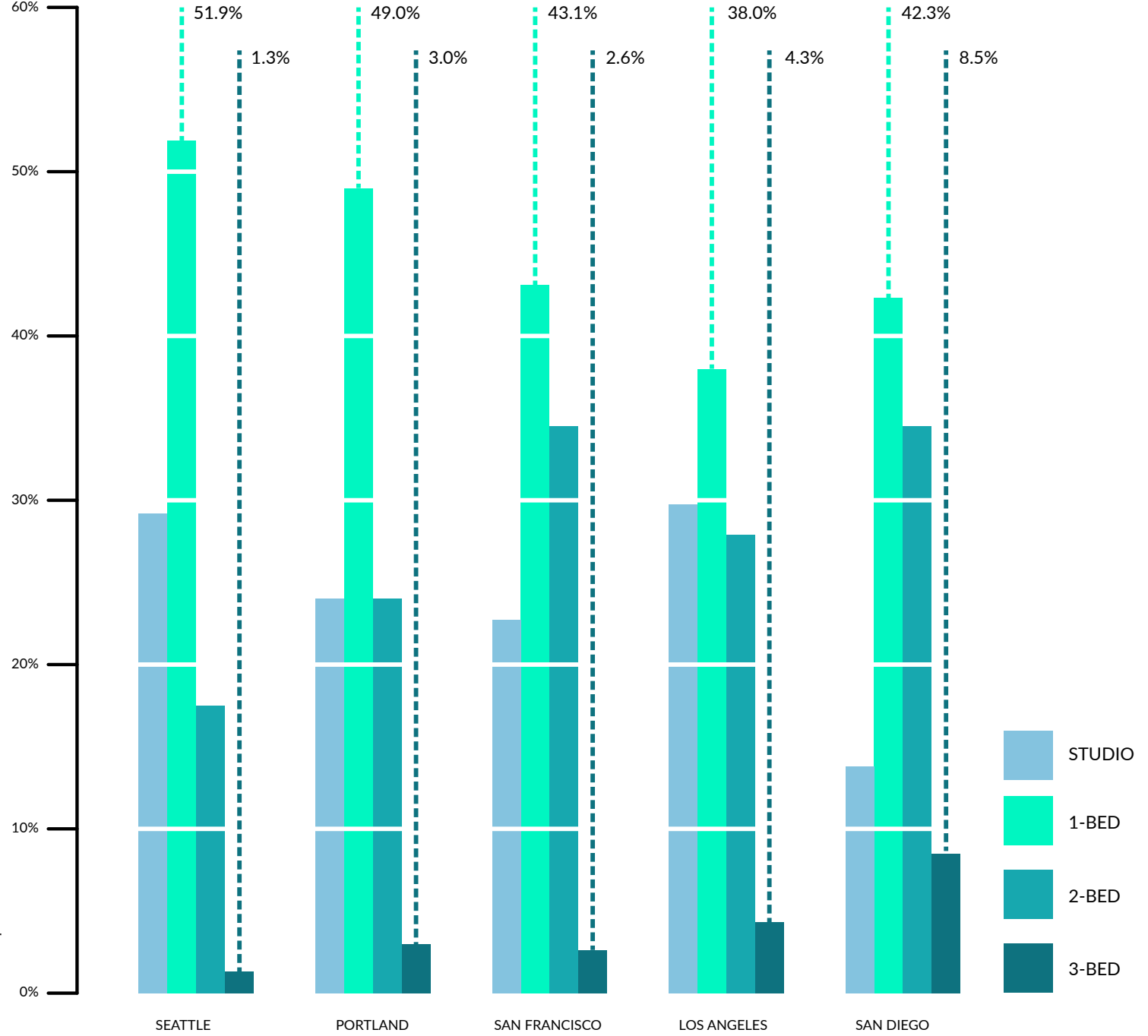


Figure 5 - Comparison of multi-family unit construction by type by city
 Diagram: Brad Valtman
 Data Source: Lloyd

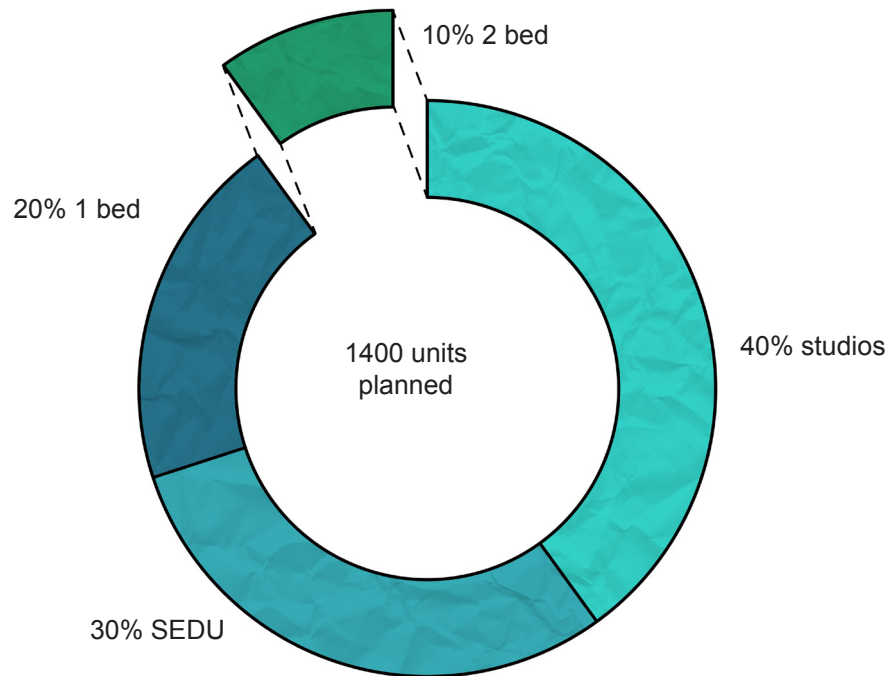


Figure 6 - Unit mix of projected projects around the Roosevelt Light Rail station
 Diagram: Brad Valtman
 Data Source: Seattle in Progress

with Portland, OR following a similar trend, shown in figure 5 (Lloyd). A 2017 analysis of new and proposed construction around the Roosevelt Light Rail Station found that of the approximately 1,400 units in various stages of development, 90% are intended for people living alone or as a couple; fully 30% were single-efficiency dwelling units (Figure 6). These developments reflect the cultural trend of viewing cities as the realm of the young, the single, the childless; as Renn points out, “in our central cities populated with largely people

who have no children, a big obsession is changing zoning regulations to allow smaller units, including so-called ‘micro-apartments.’” While this kinds of developments is certainly needed to provide additional housing for young adults, it is “not [being] paired with equal concern about creating more housing for families” (Renn). The question remains as to what happens to these units when the flow of educated Millennials ends and they begin to start families remains.

2.5 - Density, Family + Transit

Maps produced by the city of Seattle from 2010 clearly reveal the inverse relationship between families. Figures 7 and 9 show the density of population and housing units respectively by census tract while figure 8 shows the density of children. Density of both population and housing units is concentrated in the downtown core and surrounding census tracts while decreasing towards both the Puget Sound and Lake Washington. However, the population density of children follows the opposite pattern; children are concentrated

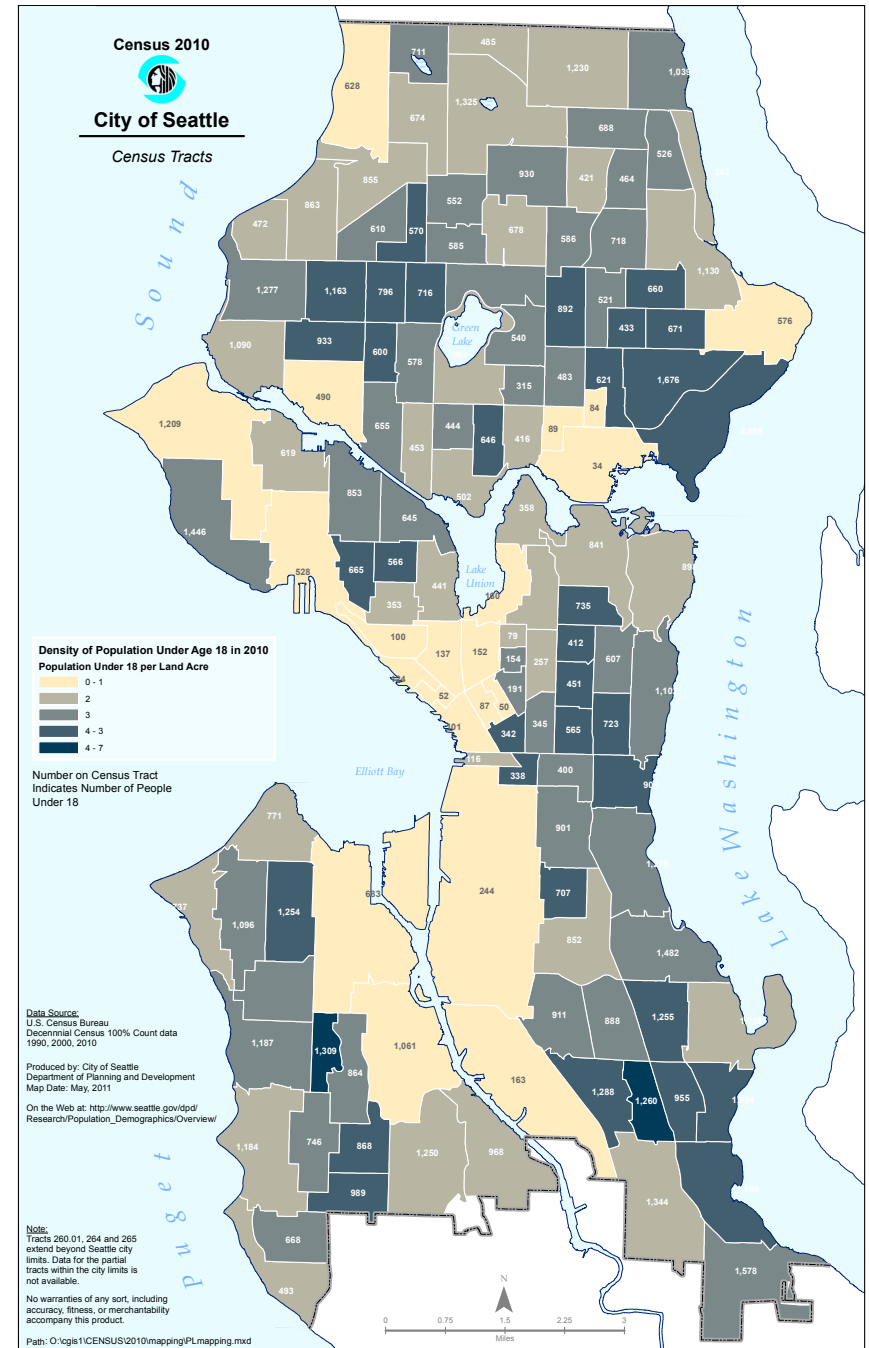
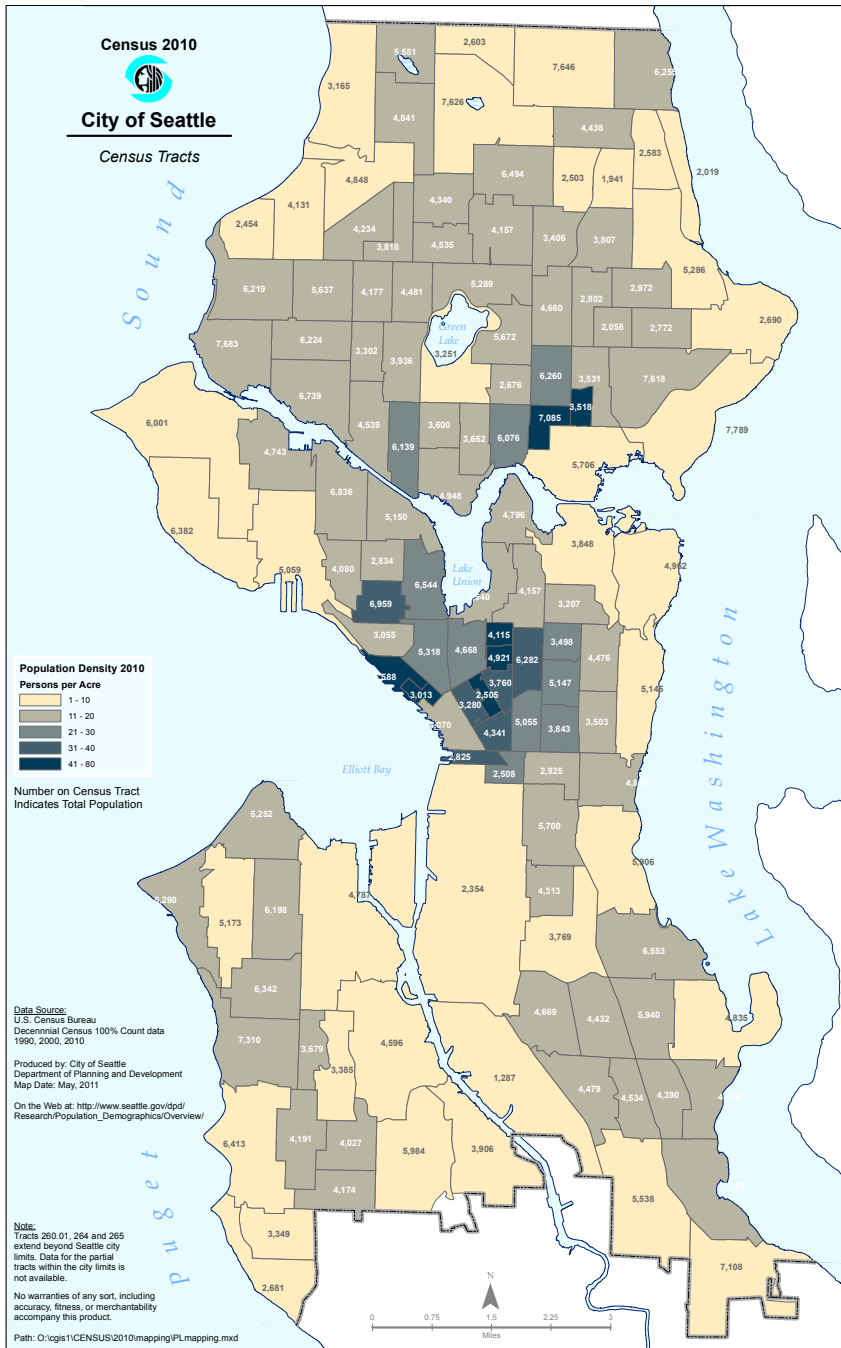


Figure 7 - 2010 population density

Source: Geographic Files and Maps, Office of Planning & Community Development

Figure 8 - 2010 children population density

Source: Geographic Files and Maps, Office of Planning & Community Development

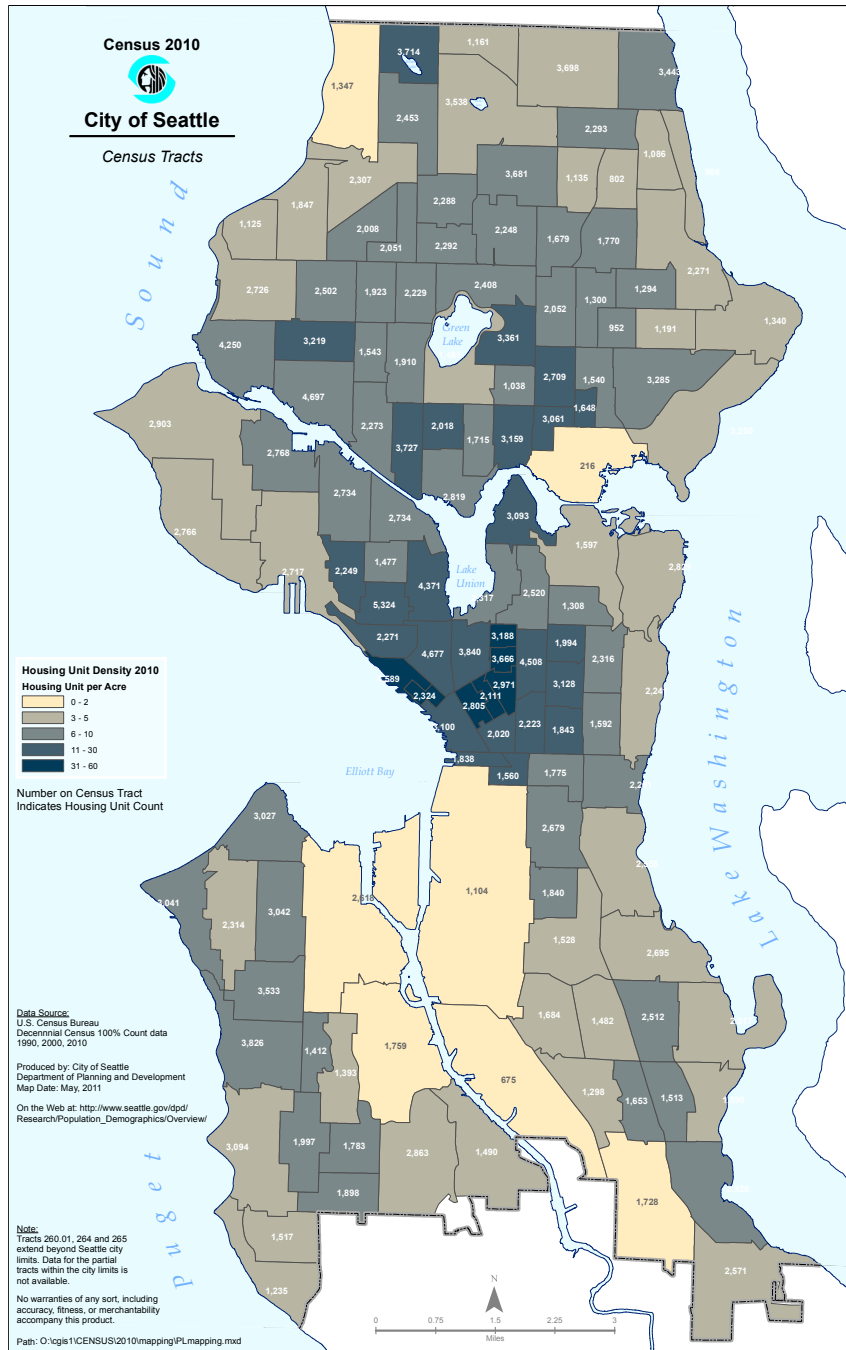


Figure 9 - 2010 housing unit density
 Source: Geographic Files and Maps, Office of Planning & Community Development



Rail-based Transit
 >30 units/acre
 Image Source:
<https://www.theurbanist.org/2018/09/21/sound-transits-level-2-evaluation-narrows-path-for-ballard-and-west-seattle-link/>



Bus Rapid Transit
 >30 units/acre
 Image Source:
<https://www.chinadialogue.net/article/show/single/en/10631-Can-Chinese-cities-leave-the-car-behind->



Bus
 10-20 units/acre
 Image source:
<http://www.governing.com/topics/urban/gov-seattle-bus-fare.html>

Figure 10 - Comparison of density thresholds by transit mode

towards both coasts while the downtown core shows a lower concentration of children.

To be clear, density for density's sake is not the objective; density requires investment in infrastructure and urban amenities to make it livable. Transit investment is a particular concern, especially in Seattle, and for this reason, this thesis uses transit as a lens to define the urban density sought in this design investigation. Utilizing Vishan Chakrabarti's definition

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 - Single-family Detached Housing (SFDH) Typology Analysis

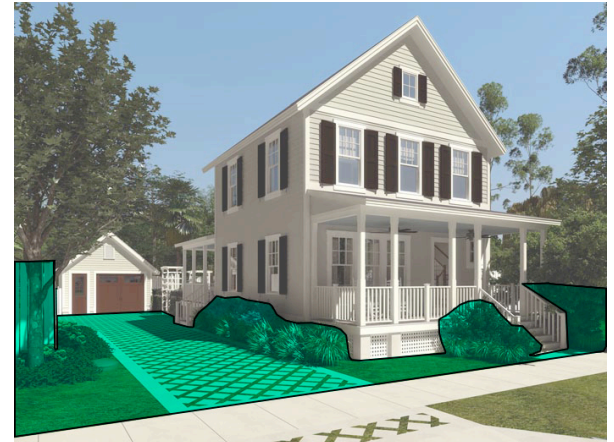
Since single-family detached houses (SFHD) are considered the normative dwelling for families and children in the United States, in order to design multi-family projects to better suit their needs, it becomes important to examine both the physical amenities provided by SFHD as well as the socio-cultural ideas bundled together with them. Figures 12 and 13 shows a summary of the key amenities provided by core components of the SFDH.

3.1A - Physical Amenities of SFDH

At the most basic level, SFHD typically provide the space families need to successfully inhabit their homes and conduct their everyday lives, including “space to live” and “space to play” (Lauster 150). This manifests both as space for things needed for everyday living, but also for “necessary things” that are used more sporadically such as tools for

Front Yard

1. Access to nature
2. Public buffer
3. Connection to community



Back Yard

1. Access to nature
2. Privacy buffer
3. “No leash” zone



Figure 12 - Single-family Detached Housing Analysis: Exterior

Porch/Stoop

1. Public-private interface
2. Connection to community
3. Public Buffer
4. Access to nature



Flex Space

1. Bulk/long-term storage
2. Options for conversion
3. Options for guests
4. Potential additional income



Figure 13 - Single-family Detached Housing Analysis: Interior

hobbies or work brought home (151). In particular, greater space allows for hobbies or work to be left undisturbed by the needs of everyday life and decreases potential conflicts over spatial control (152). Additionally, more space enables the better formation of routines by allowing more room for the objects and actions that underlie habit formation, transforming a house into a home (149). Additionally, greater space allows SFHD to offer more options for storage, in areas like closets, attics, basements, and garages, that are at a premium in most multi-family units. In particular, storage for large and bulky items that may not be used on a daily basis are often still considered necessary is an important amenity, particularly for items related to child rearing such as strollers and toys (151).

Providing opportunities for social engagement and activities is also an important component of space; it allows space not just for things, but for people as well. As Lauster notes, “people need room to play within their networks of people, just as they need room to play with their network of things” (154). Well-designed space also helps families exhibit hospitality by providing room to accommodate visiting

family and friends, an important component in maintaining social ties (154). When families lack the right amount and quality of space however, studies in Singapore have shown that, “the resultant crowding and lack of privacy can result in emotional stress and an inability to perform the types of activities believed to hold families together” (Appold + Yuen 571).

Importantly, space also contributes to privacy within and without the dwelling unit. SFDH preserves “space for living with – and apart – from others” (Lauster 153), allowing families to inhabit their homes jointly and separately; space is needed to “distinguish together activities from apart activities” (156). Not only does this allow family members to claim their own personal space separate from the rest of the family , it allows the house to contain public and private spaces for friends and guests. This separation of the public and private spheres within the house mirror “broader divisions into private and public spaces” across the neighborhood and city as well, and greater space within a unit allows this division of public/private space to occur (154).

Another key amenity offered by single-family detached housing are yards and other types of outdoor space. By their very nature, yards provide easy and immediate access to the outdoors without requiring an excursion to the nearby park. Perhaps more importantly, “a yard provides a safe form of access to the outside. In a sense, it offers a place to play, to try out new activities, to mess around, that still seem safe from intrusion... yards replace leashes, for both dogs and children” (Lauster 173). While there has been little research into the role pets play in establishing people’s sense of home, the ability to have a pet, and particularly a dog, is enabled by the presence of a yard (171). As Lauster states, “yards enable the home networks of people and dogs to coexist and support one another with only limited imposition or interference” (171).

Visual access to yards is just as important as physical access. The ability to have light and views from more than one side and opportunities for fresh air through natural ventilation can provide as much of a connection to the outdoor world as being able to step outside. According to Safdie, “we intuitively prefer rooms that look out in more than one direction; light

streaming in from multiple directions is psychologically different from light entering only one of four walls” (80).

Yards also acts as buffers between the privacy of the SFDH and the public sphere. Lauster notes that yards offer “an additional barrier to intrusion” that provide “greater control over noise, and extra space for people to spread out their network of inhabitation” (Lauster 170). When comparing SFDH to multi-family “towers in the park”, Larry Ford asserts that “while traditional neighborhoods provided a gradation of territories from major street to residential street [to sidewalk] to stoop to house, towers in a park did not. All was public space right up to the apartment door; there were no appropriate niches for socializing beyond the door” (213). The porch in particular serves a critical role in mediating between the public and private, creating a “social setting for meeting neighbors and passers-by... and chatting after dinner in the evenings, and in general, it served as a transition zone between the private house and the public street” (Ford 141).

By providing this “gradation of territories” between the public and private sphere, yards also allow for a private

entrance directly off the street rather than requiring residents to traverse “the ubiquitous, artificially ventilated and lit corridor buried between apartments on either side,” as Moshe Safdie critiques. He observes that “the trip from outdoors – riding the elevator and traversing the stuffy corridor to the apartment – remains a major reason people have preferred low-rise housing” (79).

While the physical amenities of SFDH have contributed to its rise as the eminent habitat for families in the United States, by analyzing the roles they play and services they offer to families, it becomes possible to rethink them. It becomes possible to reinterpret and hybridize them with denser forms of dwelling while still providing the same services to families.

3.1B - Socio-cultural Amenities of SFDH

Beyond simply providing key physical amenities for families, SFDH additionally offer a number of important socio-cultural amenities as well. One of the key socio-cultural amenities provided by SFDH is ownership and the associated sense of stability. Nathanael Lauster notes that “houses

overlap most with ownership, and the form of ownership provided by the house seems to offer the greatest degree of independence from the whims of others” (169). Even though ownership occurs in other forms of dwelling, such as attached townhouses or condominium towers, the dominant perception is that “a house meant ownership, and ownership meant a house... the partially shared nature of condominium ownership meant that it was not, in some fundamental way, real ownership” (Lauster 32). A key component of ownership is the implied control it offers to home owners; as Lauster asserts, “ownership of a house offered potential refuge from intrusions associated with competing claims of control over space” (168). He continues, saying, “the house as a package still seems to maximize the control available to the household it contains, cutting off the external claims of landlords and strata councils” despite the obvious need to still adhere to municipal regulations and standards (168-9). These expectations and associations of ownership and control partially stem from the SFDH’s relationship with regulations: “cultural associations constructing the meaning and importance of the house shifted

in subtle ways and across multiple domains after its regulatory codification, incorporating a singularly defined family and also adding desires for and expectations about ownership, roominess, and a yard to the mix” (Lauster 38).

In addition to the cultural importance of ownership, one of the key socio-cultural amenities associated with SFDH is the strong cultural association with families and child-rearing. Lauster succinctly elaborates: “the house spoke to the unity of idea and form, family and structure, building and dwelling, habitat and inhabitant” (15). Part of this is simply the fact that SFDH homes are the primary dwelling unit for most children in the United States (Lauster 36) Over half of families with at least one child reside in SFDH and this number only increases with the number of children in a household. This trend has a clear influence on how American culture views the proper dwelling for children; as Lauster notes, “children are even more like to live in detached houses than adults, and the vast majority of North Americans grow up in them, underscoring the connection between house and family and further explaining its ‘naturalness’ [as a space for child-rearing] for most adult”

(31). He continues, saying, “in short, the house is the first form of dwelling that most children come to recognize,” and so this creates strong cultural ties between children and SFDH (31).

The historical codification of SFDH and the regulatory impacts of zoning also played a role in cementing the relationship between houses and families. In speaking of the adoption of zoning in the early 1900’s, Lauster explains:

“Restrictions placed on the use of houses left family defined largely along the lines of blood, marriage, and adoption. As a result, family became at least theoretically separable from house and household. The single-family detached house, then, could be defined with reference to both its separation from built structures around it and its containment of a single family, where all members’ relationships could be independently verified by lineage or legal document. The work they did for one another remained, by definition, non-commercial. The two terms, house and family, were legally pulled apart only to be put back together again, but in the process they were modified and clarified so that each became more exclusive” (22).

The expansion of the suburbs after WWII, with the resulting population boom from delayed family formation during

wartime, also contributed to the cultural associations. As the suburbs expanded with affordable SFDH, the birthrate in the 1930s grew from 2.2 births per woman to 3.5 in the 1950s; pregnancy was even described as “the Levitttown look” after the famous prototypical post-WWII suburb, underscoring the strong connections between family formation, child-rearing, and SFDH (Ford 164).

Lastly, SFDH has strong socio-cultural associations as a symbol of success and of providing important cultural identity. Lauster notes that “through cognitive habits of association, the house has acquired symbolic value. Many people believe it is important. It has become a means of negotiation distinction and belonging – a stage on which to display one’s worth as a grown-up, a success in life, a good mother, a decent man” (Lauster 132). Owning a SFDH shows to others that the homeowner has achieved success, showing off their ability to both purchase the house as well as the host of material items that are part of maintaining and living in one. Houses become a site and symbol of conspicuous consumption as possessions become status symbols while the house

assumes an important role in showcasing that status (Ford 146). Additionally, due to the SFDH's ties to family formation, they become a marker of being a "grown-up"; Lauster also notes that "a house was expected as part of the package deal of adulthood" where "houses have become the standard habitat for North American humanity" (1). As a status symbol to the greater community, SFDH also helps forge a specific cultural identity since "houses both reflect and shape basic cultural traits" (Ford 127). As Ford notes, "to be American was to live in a house," (134) and this cultural association has roots in the founding of America itself. Ford explains: "The emergence of the American ideal of a freestanding house with a garden involved far more than just the search for more space and a little greenery. America was a new country in need of a 'culture'... and an array of individual agents "combined to create a culture around the single family [house]" (134). Not only did SFDH provide a scaffold for a unique American cultural identity, it also solidified a middle-class identity as well, so that "the association of middle-class individualism with life in a particular type of house" was crucial to the rise

of the single-family home (135). The role of the house as a status symbol was important to the emerging middle class, showcasing "that the family had achieved a standing in the emerging, yet still fragile proper middle class" (135). As a symbol of success and a uniquely American, middle-class cultural identity, SFDH provides families with much more than just physical amenities such as space and access to the outdoors. Lauster concludes: "As a cultural habitat, houses are most commonly associated with success and belonging. But both the strength and direction of these kinds of cognitive associations are malleable and negotiable for most people" as long as urban and spatial infrastructure provides a framework to support new cultural associations (Lauster 200).

3.2 - Multi-family Housing Typology Analysis

The typical multi-family typology being built currently across Seattle is well-suited for the individual or couples but is less suited to the needs of families and children. With units packed as tightly as possible and then strung along a corridor,

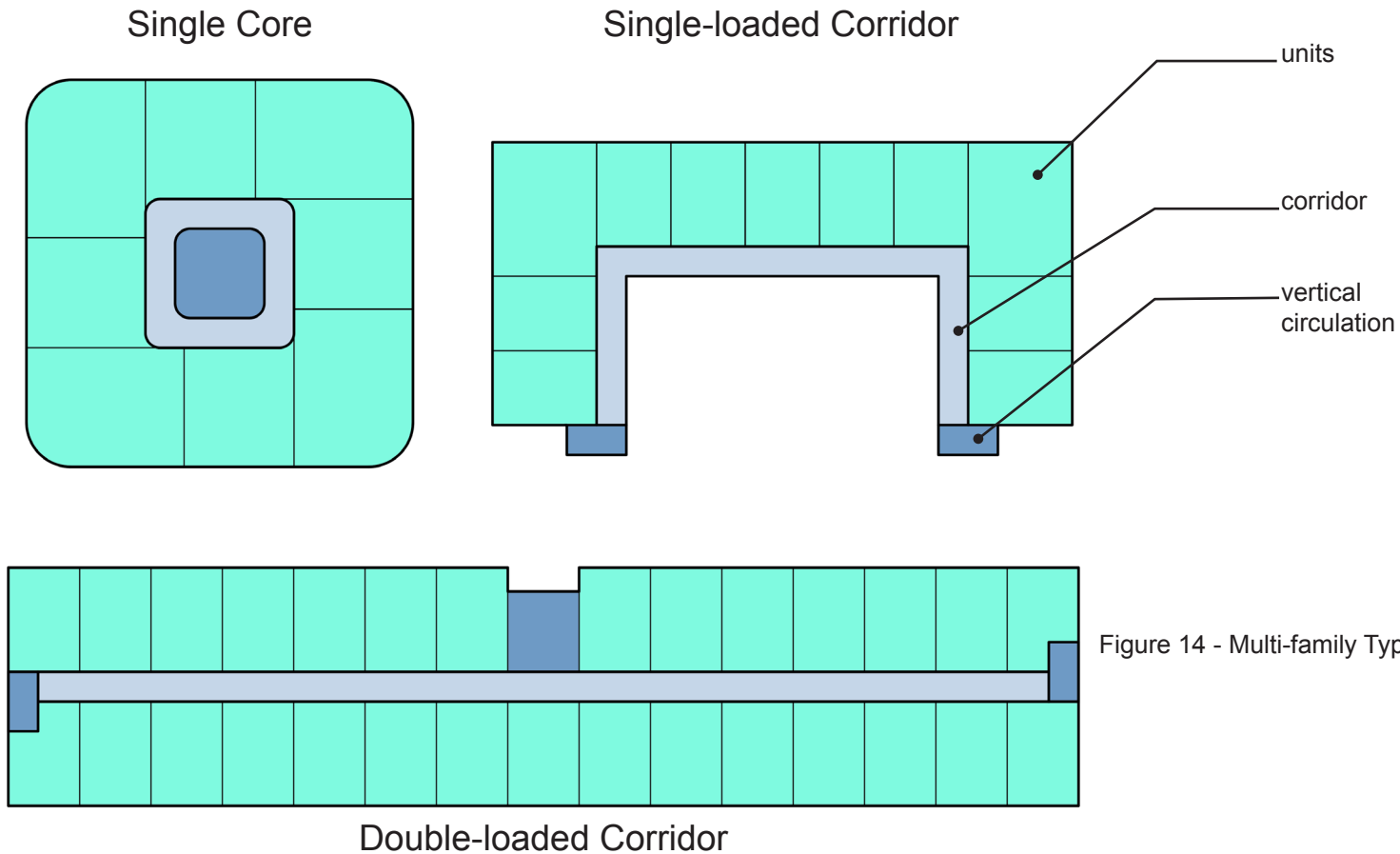


Figure 14 - Multi-family Typology Analysis

these units end up becoming “shoe boxes in the sky” where the focus is more on housing people than providing a home. In the three main configurations analyzed (single core, single-loaded corridor, and double-loaded corridor) (figure 14), the units are packed as tightly as possible to maximize economic returns, strung along a corridor with vertical circulation often

tacked on or tucked in at the ends of the hallway. This constrains individual access to daylight, precludes natural ventilation (with the possible exception of the single-loaded corridor) and enshrines the elevator as the key means of circulation. Additionally, the corridor is treated solely as a space to pass through rather than occupy, and the thresholds

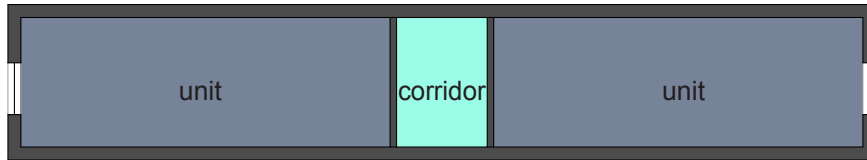


Figure 15 - Typical Multi-family Public/Private Gradient

between public, semi-public, and private can be definitive and harsh, seen in figure 15. Lastly, the building envelope fully contains the units, creating an overwhelming uniformity and severely limiting, at best, the individuality of the units and their occupants. Overall, the typical multifamily typologies are poorly suited to providing a viable option for families with children within Seattle.

3.3 - Family Needs in Urban Housing

This thesis recognizes housing options are just one of a myriad of factors influencing where families decide to settle and raise children. Factors such as crime, access to goods and services, and the condition of the local education system also play a role. Affordability is also a concern, but this thesis is not explicitly concerned with addressing “affordable housing” as it is typically construed. Instead, this project is

attempting to tacitly provide a greater number of affordable family housing, at least for the middle class, through the agglomeration of many units. Housing price data from 2016 indicates that the mean housing price varied significantly by type. Though the mean value of all housing units in Seattle was around \$680,000, the mean SFDH was valued around \$726,000 while housing in 5-or-more unit buildings had a mean value of \$495,000 (Seattle). Providing more options for families between undersized units in multi-family buildings and SFDH is a critical piece of addressing affordability on a broad scale.

3.4 - Precedent Analysis

While multi-family living in America struggles to support families with children, this is not the case globally. Two examples of existing projects from across the globe offer useful insights and ideas that can be translated to an American context.

3.4A - 8 House | Bjarke Ingels Group | Copenhagen

The 8 House is a 475-unit, multi-family project located in the Copenhagen that creates a sense of community for a range of residents, from singles to families to empty nesters (Jae-yeun 78). Designed by Bjarke Ingels Group, the project utilizes a series of exterior ramps to provide continuous connection from the ground plane to the top floor.

Lessons Learned:

Formally, this project responds to site conditions to allow for increased daylight and air penetration into the center of the project. By reconceptualizing the corridor as an extension of the public street, sharp boundaries between public and private start to blur and overlap, creating opportunities for community engagement. This is particularly true with townhouse units fronting the pathway; they have small terraces that demarcate a semi-private buffer between the unit and the path which creates a zone for mingling. Additionally, the project has three unit types (apartments, townhomes, and penthouses)

with both rental and owned units to cater to different needs of residents at different stages of life. This helps foster a diverse community in terms of age and income. Lastly, the integration of the project into the urban context programmatically and spatially is important; programmatically, retail and office spaces contribute to an active street life while offering options for building residents. Spatially, passages are carved out of the building mass to allow public access to the courtyards and through the project as a whole. Here, the sloping pathway works to further integrate the building to the neighborhood by literally allowing the public up and through the project.



Figure 16 - Courtyard-facing terrace at the 8 House.
Source: <https://www.visitcopenhagen.com/copenhagen/8-house-gdk539319>



Figure 17 - Ramped path provides interstitial play space with units overlooking for passive surveillance and security.
Source: <https://arcspace.com/travel/travel-guide-copenhagen/>



Figure 18 - The public ramp connects all of the units and provides for a buffer “front porch” or terrace between the unit and the walkway. This also provides space for greenery and access to nature.
Source: <https://www.designboom.com/architecture/big-bjarke-ingels-group-the-infinite-happiness-film-8-house-ila-beka-louise-lemoine-chicago-architecture-biennial-10-29-2015/>

3.4B - Interlace | OMA | Singapore

The Interlace is a 1040-unit mixed-use housing project in Singapore that reconceptualizes the typical high-rise residential tower as a collection of interlocked buildings. Designed by OMA, it provides a new model that spatializes the residential tower beyond the simple extrusion of typical residential towers (Choe).

Lessons Learned:

The key lessons from the Interlace relate to how the project reconceives the formal qualities of high-rise residential architecture. The isolated, single tower in the park of Le Corbusier is reimagined as a vertically-organized village, creating a porous massing that allows light, air, and views to permeate the project and making them accessible to all units. Although the blocks of housing themselves are almost overwhelmingly uniform in appearance, breaking up only for interspersed balconies (figure 20), the shifting relationships between the housing block masses creates a continuously

unfolding spatial complexity that provides an ever-shifting experience (Choe). Additionally, the organization of amenity space is critical to creating a highly-livable development. While the ground plane boasts a number of amenity spaces for residents, amenities are also distributed three-dimensionally, increasing accessibility to the units while also opening up the prestigious city views of higher levels to all residents. These sky gardens are particularly important for providing access to nature and enable to project to cover 112% of the project site with landscaping (ULI)



Figure 20: Though uniform in massing, the stacked blocks create a varied vertical experience and open the ground plane up for landscape and amenity space.

Source: <http://buro-os.com/the-interlace/>



Figure 21- Elevated terraces provide units with a greater range of outdoor spaces while the shifting massing provides changing views as residents move through the project.

Source: <http://buro-os.com/the-interlace/>

CHAPTER 4: SITE SELECTION + DESIGN METHODOLOGY

4.1 - Design Investigation Goals

The overall goal of this thesis is to investigate how architecture can reconceptualize high-density multi-family housing to offer a viable alternative to the SFDH for families with children through the hybridizing of SFDH amenities with the form of the residential tower. As the research revealed, larger unit sizes, though important, are not solely the answer; architecture needs to offer solutions that fulfill not only the physical, but the socio-cultural needs of families and children through the fostering of community and an expanded sense of home. This project recognizes that families need another option of housing type beyond the “shoe box in the sky” multi-family unit (whether apartment or condominium) and a SFDH. In addition to the overall project goals stated above, the proposed thesis project seeks to do the following as well:

1. To offer alternative housing options for future families in Seattle that allow them to remain in the city and take advantage of urban density rather than necessitating relocation to the suburbs.

2. To foster a sense of home that expands beyond the front door of the unit through careful consideration of the interstitial, connective tissue.

3. To explore better ways of integrating residential towers with the fabric of the city.

4. To promote sustainability through encouraging densification and active mobility, as well as providing ample opportunity for daylight, natural ventilation, and connections to nature.

5. To instigate conversations about how to integrate higher-density housing throughout a greater portion of the city, particularly areas of low-density that are well-served by transit and other amenities.

4.2 - Site Selection

With the goal of instigating density outside of the downtown core and reconnecting high-density housing with family housing, the site selection process began through a series of mapping exercises, figures 22 and 23. The first

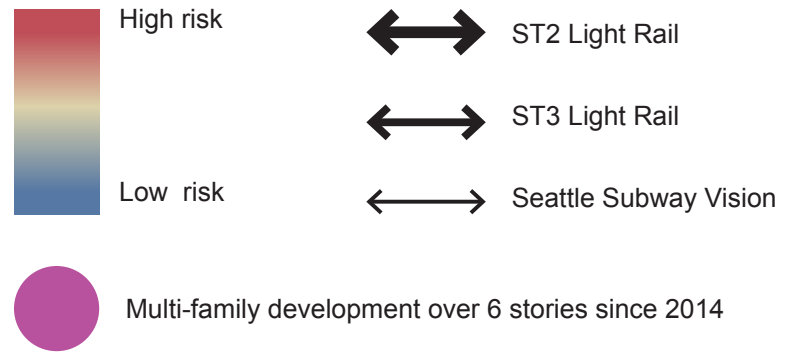
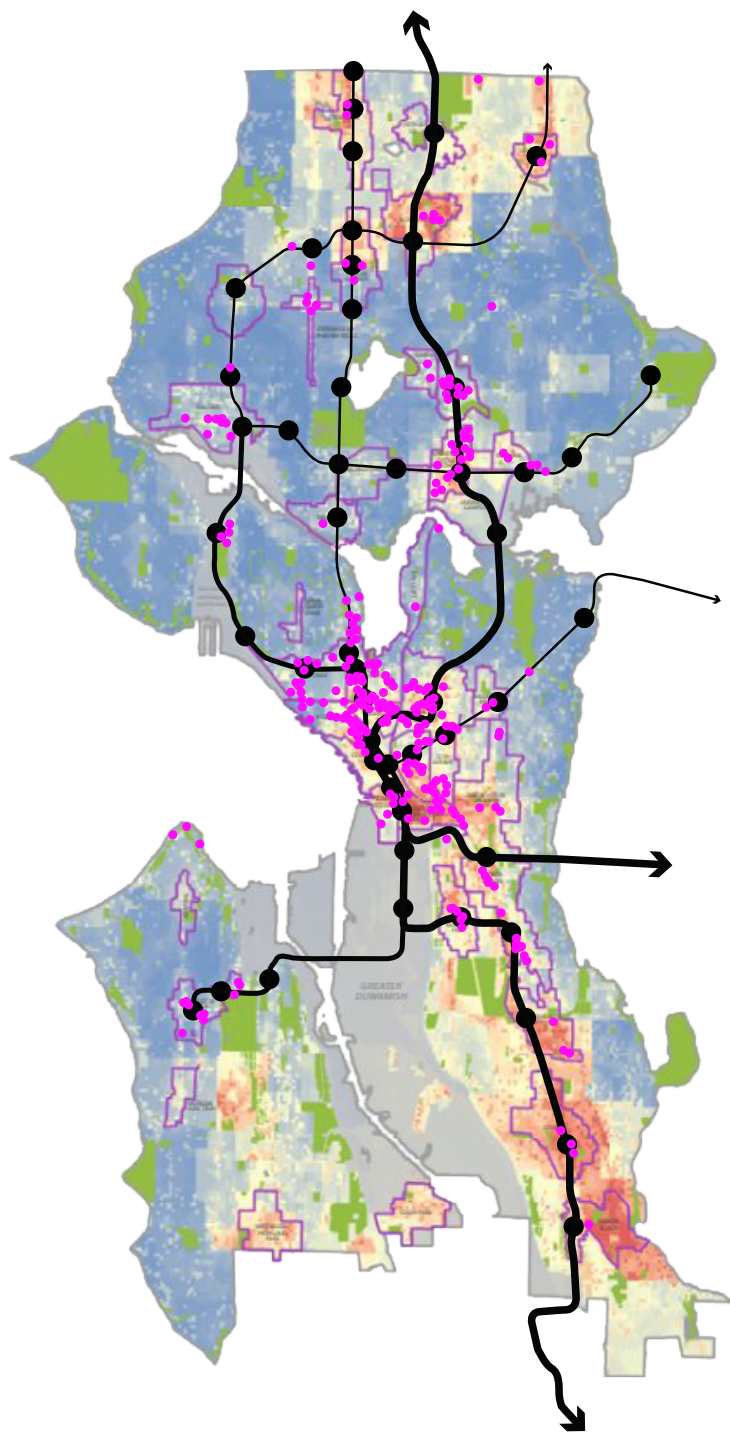


Figure 23: Displacement Risk vs. Transit Expansion vs. new multi-family construction over 6 stories
 Diagram: Brad Valtman
 Data Source: City of Seattle, Seattle in Progress

map, figure 23, overlays the Seattle Subway Vision Plan with a displacement risk map generated by the city of Seattle to see how the anticipated future transit investment interacts with expected issues of displacement. While not the focus of this thesis, gentrification and resultant displacement are important factors to consider for new housing. Seattle's displacement index combines an array of data indicators such as race, educational attainment, household income and housing tenancy. More data can be found in [the Seattle 2035 Growth and Equity](#) report. Additionally, locations of new or planned residential developments over 6 stories are layered on to show areas currently where high-density development is currently occurring.

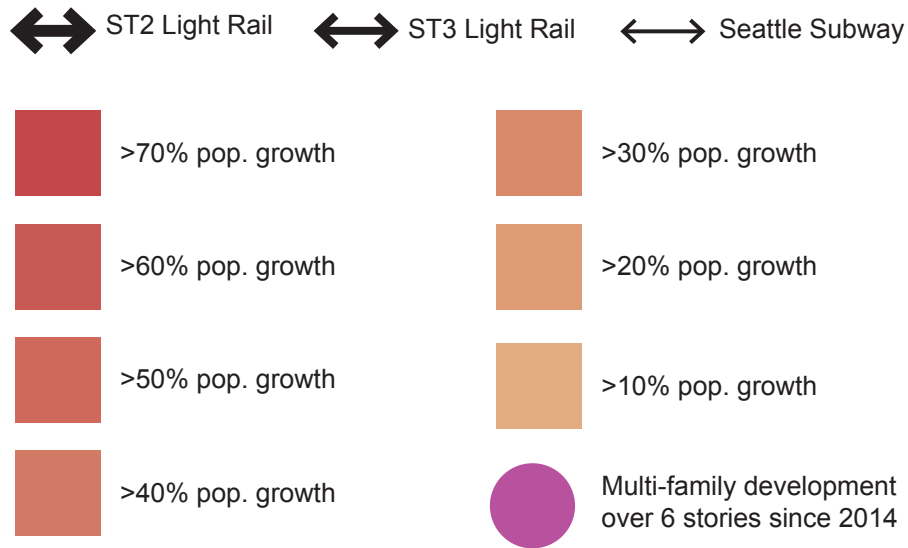
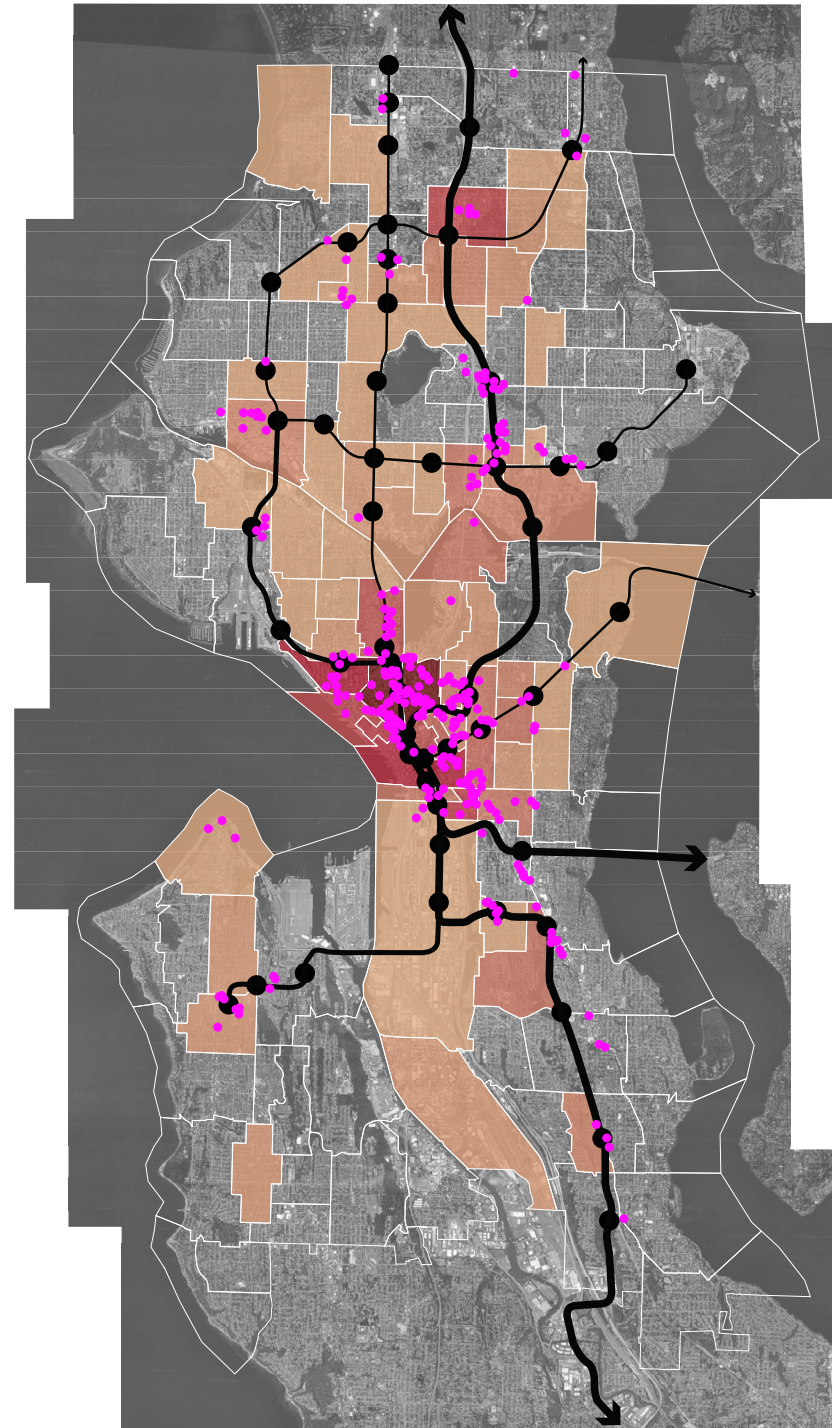


Figure 24: Expected population 2040 population growth vs. Transit Expansion vs. new multi-family construction over 6 stories
 Diagram: Brad Valtman
 Source: City of Seattle, Seattle in Progress

By overlaying the information, this map highlights locations along the new transit system that have both low displacement risk and a lack of new or planned residential development, indicating opportune areas to propose new density. This map identifies northwest Seattle as a prime area for potential density; it has much less displacement risk than areas of South Seattle along the existing light rail spine while still having access to a number of new high-capacity transit stations. Additionally, while a few stations show anticipated increases in residential density through new

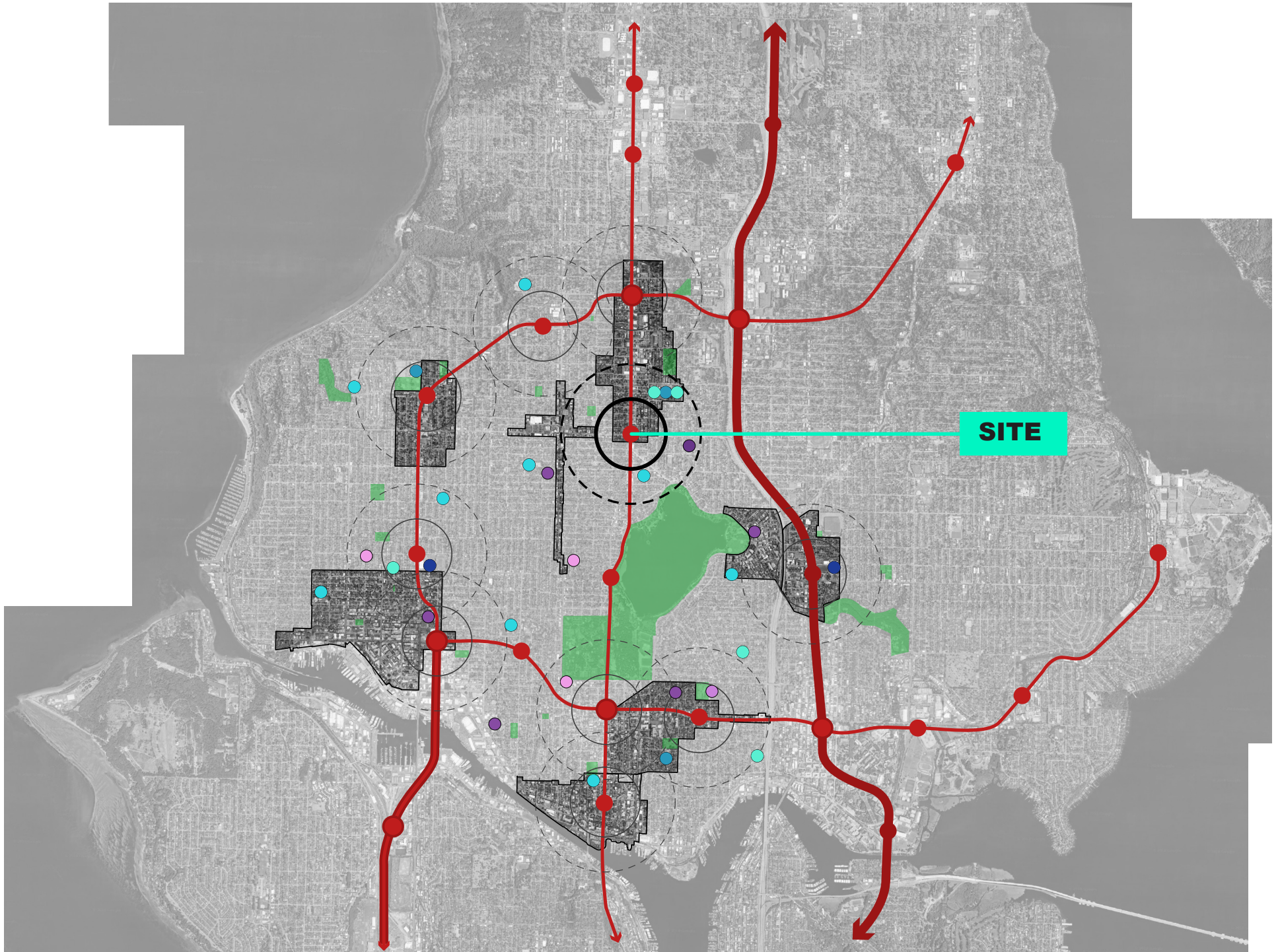


construction, several stations are devoid of new development over 6 stories. In a similar process to figure 23, the second map, figure 24, overlays the Seattle Subway Vision plan and new or planned residential developments over 6 stories with projected population growth data from the city of Seattle. This mapping further highlights the anticipated need of increased housing density in northwest Seattle and supports this area as the ground for inquiry.

Following the selection of northwest Seattle as the general site location, another series of maps examined key neighborhood amenities identified in the research, namely schools and parks, in relation to the conceptual 5- and 10-minute walk sheds for the new transit stations, as seen in figure 25. This map also considered the relationship to existing urban village boundaries, with the assumption that these will continue to guide Seattle's largest density increases. Of the new transit stations proposed, this mapping highlighted the intersection of Aurora Avenue and N 85th Street as a location with multiple schools of varying types within the 10-minute walk shed of the station (Daniel Bagley Elementary, Cascadia

Elementary, Licton Springs K-8, Robert Eagle Staff Middle, and Bishop Blanchet High) as well as access to three parks (Licton Springs Park, Greenwood Park, and Green Lake Park). Because of the proximity of these key amenities, this station was chosen for the project site location.

Due to the connection between transit and density, it was important that the site be located on one of the four blocks immediately surrounding the intersection. The southeastern block was ultimately chosen for several key reasons. Firstly, the block's east-west orientation provided better sun access as well as providing more units with better views. Due to the topography of the surrounding neighborhood, the site sits at a low point between ridges to the east and west, blocking views of both the Cascades and the Olympics. However, this also allows for relatively unobstructed views south towards Green Lake, the downtown skyline, as well as Mt. Rainier. Topography also contributed to the site's selection due to its relative flatness; compared to the other quadrants, the site only varied by 2 feet or less over the 200 feet of its eastern and western edges. The existing uses on the block also



SITE

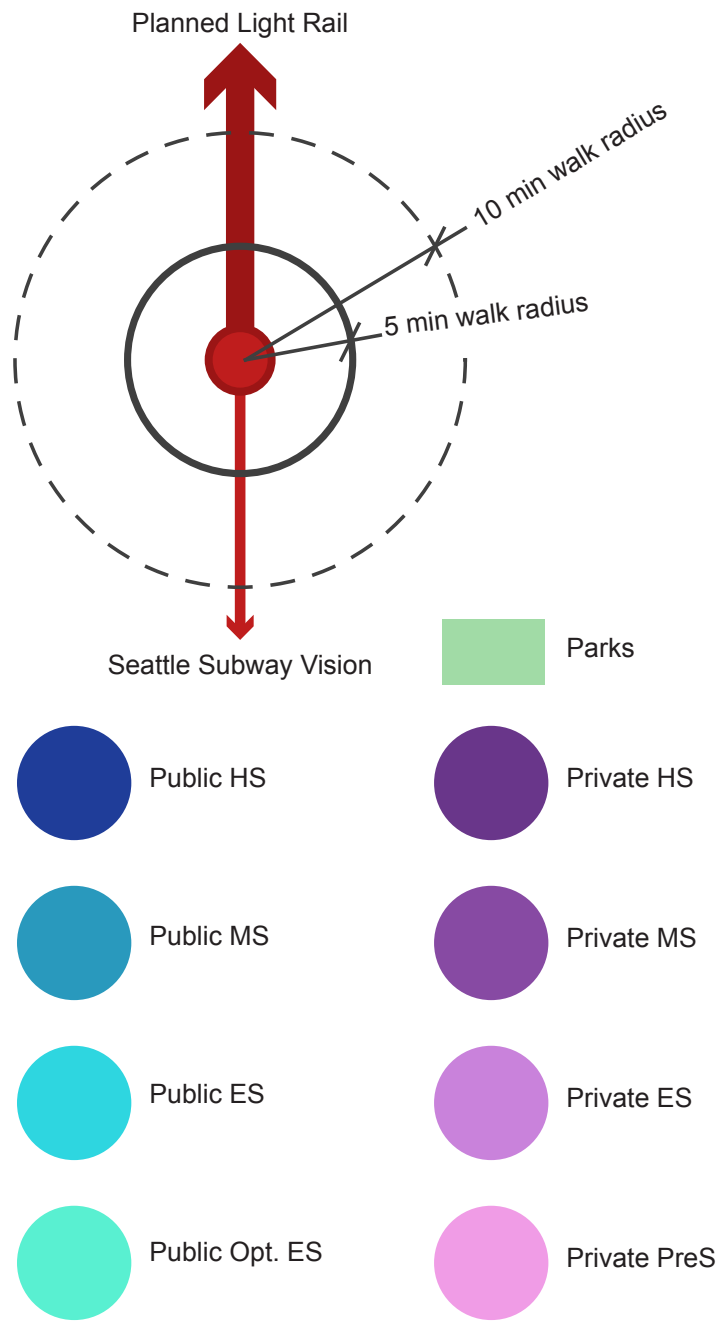


Figure 25: Map of light rail expansion, proposed station locations, nearby schools and parks and the 5- and 10-minute walk sheds around the stations.

strengthen the argument of this thesis conceptually. While the block is made up mostly of family-oriented SFDH and townhomes, the parcel along Aurora Avenue is a gas station, reflecting the auto-oriented history of the area. Not only does this thesis propose replacing existing family-oriented housing with higher-density family housing, it simultaneously replaces an auto-dominated use with a use better suited to supporting transit usage and higher-quality urbanism. Lastly, this block provided the easiest walkable routes to the schools within the 10-minute walk shed. Children would only need to cross one major street at the intersection of N 85th St. and Nesbit Avenue, avoiding the heavily-trafficked Aurora Avenue; otherwise, their routes would be on quieter residential streets.

4.3 -Site Analysis - Existing + Anticipated

The site is located on the southeastern block at the intersection of Aurora Avenue and N 85th Street, as seen in figure 26. It sits within the Aurora-Licton Springs Residential Urban Village, but borders the neighborhoods of Licton

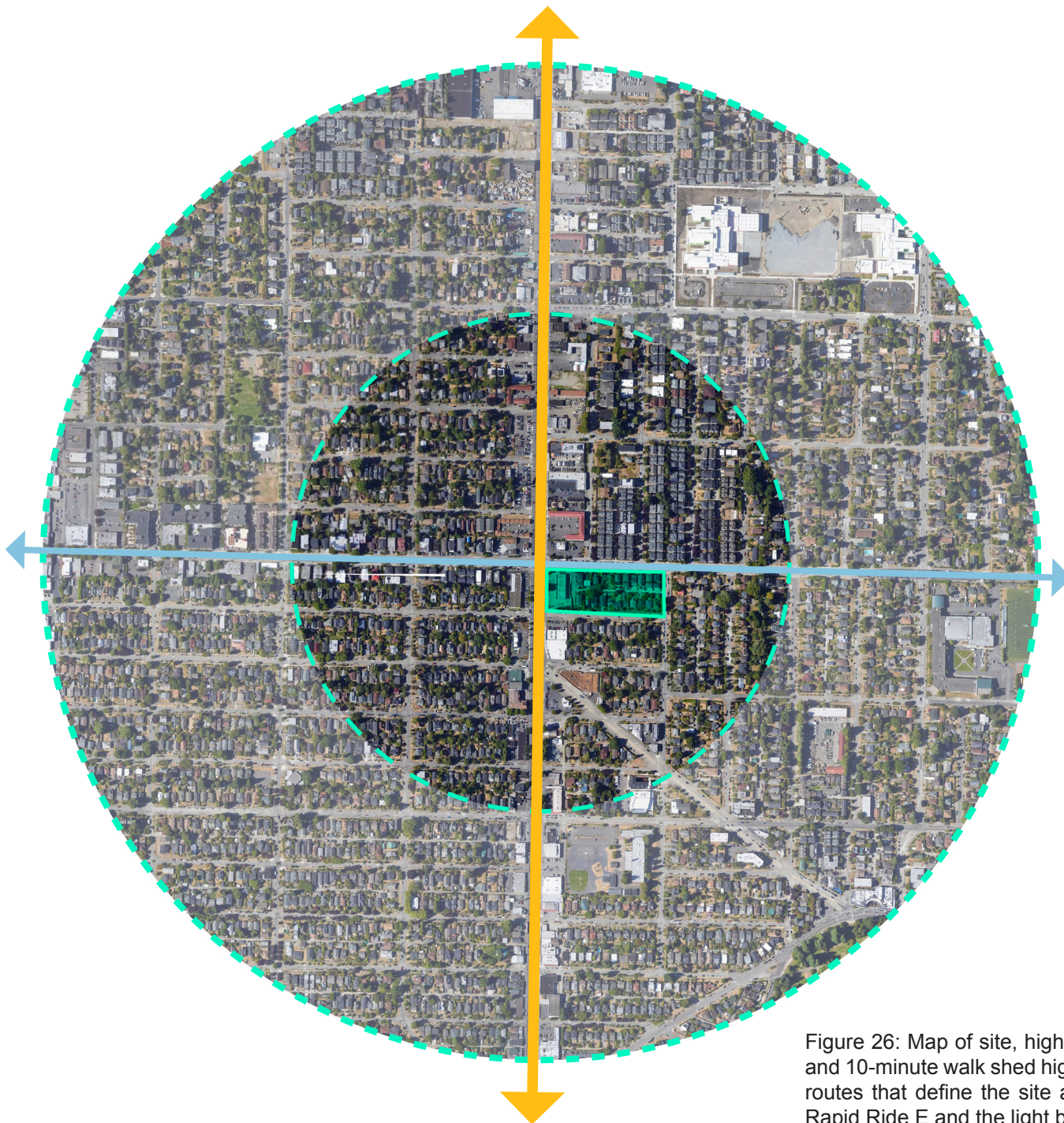


Figure 26: Map of site, highlighted in green, with the 5- and 10-minute walk shed highlighted. The two main bus routes that define the site are also shown; gold is the Rapid Ride E and the light blue is the 45.

Springs, Greenwood, and Green Lake. Bordered by two main arterials, Aurora and N 85th, and two neighborhood streets, N 84th and Stone Ave N, the site experiences very different conditions at the edges of these two street types. The main arterials are heavily trafficked, and thus create much noise while the neighborhood streets are quieter with much less traffic. As stated previously, an overwhelming majority of the site is occupied by a mix of residential uses ranging from SFDH to townhomes. A gas station occupies the corner parcel at the intersection, reflecting the car-dominated uses that characterize much of the Aurora corridor. While the site is relatively flat, the topography rises sharply up to the west along 85th St and slopes more gently up heading east. The surrounding context is dominated by low-rise residential development; SFDHs make up the surrounding blocks to the south while townhomes are the primary development north of 85th St. Commercial uses line Aurora, with many of them relating to the car, such as gas stations, used car lots, and auto-mechanic shops. These can be seen in the massing diagrams in figure 27 and 28. Importantly, the E Rapid Ride

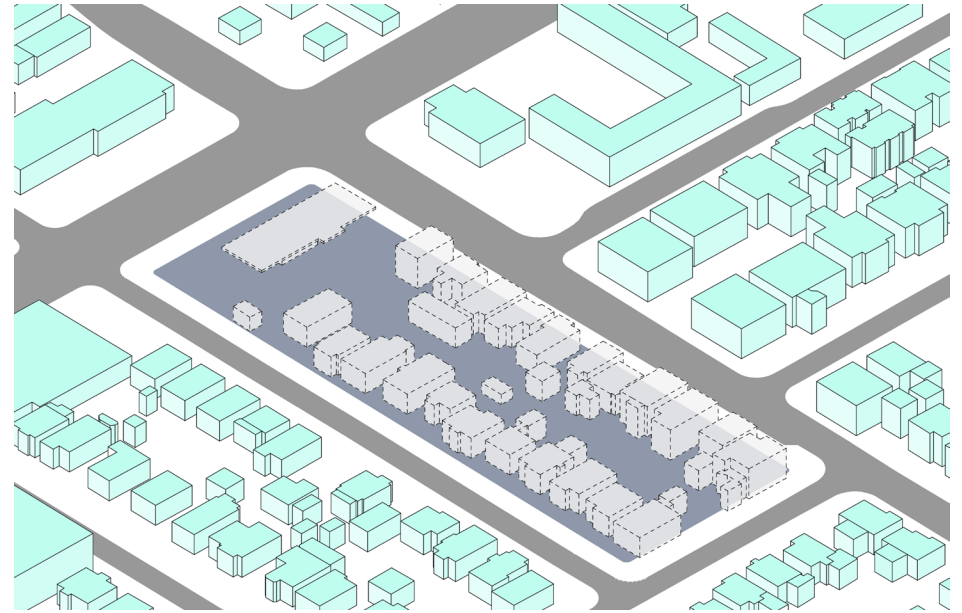


Figure 28: Massing of the site (in blue) and the surrounding context. The dashed lines show the existing buildings on the site.

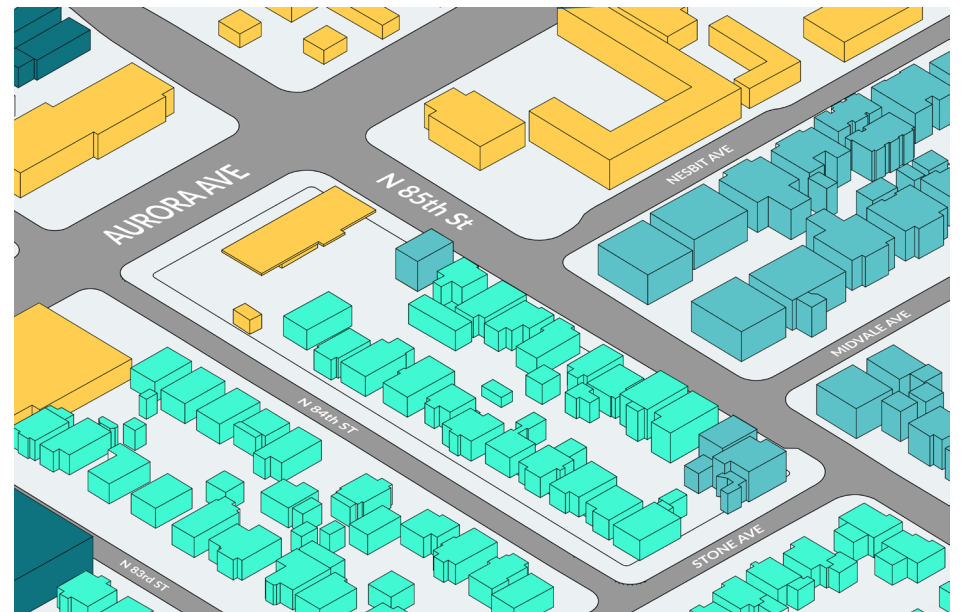


Figure 29: Massing showing the programmatic mix of nearby uses. Retail is shown in gold, single-family in mint green, townhomes in light teal, and low-rise multi-family in dark teal.

bus, the route with the highest average weekday ridership in the city, runs along Aurora Ave, highlighting the street's importance as a key transit corridor in the city (Englehardt). The 45 route also adjoins the site, running along N 85th St to connect west towards the Puget Sound and east towards Green Lake and the University of Washington campus (see figure 26).

By using the Seattle Subway Vision Plan as a framework to imagine a denser Seattle, this thesis imagines the site just over 20 years into the future to 2040, shown in figure 30. The site sits at a new station for an upgrade Rapid Ride E, from a bus route in mixed traffic to a fully-separated BRT line. The 45 is assumed to remain the same, at least for the portion of the route that borders the site. Given the substantial public and private investment, the surrounding schools are anticipated to remain operational in their current locations. Most importantly, the surrounding context has transitions from a fairly low density mix of SFDH and townhomes with auto-oriented retail along Aurora Avenue into a much denser mix of residential and commercial uses.

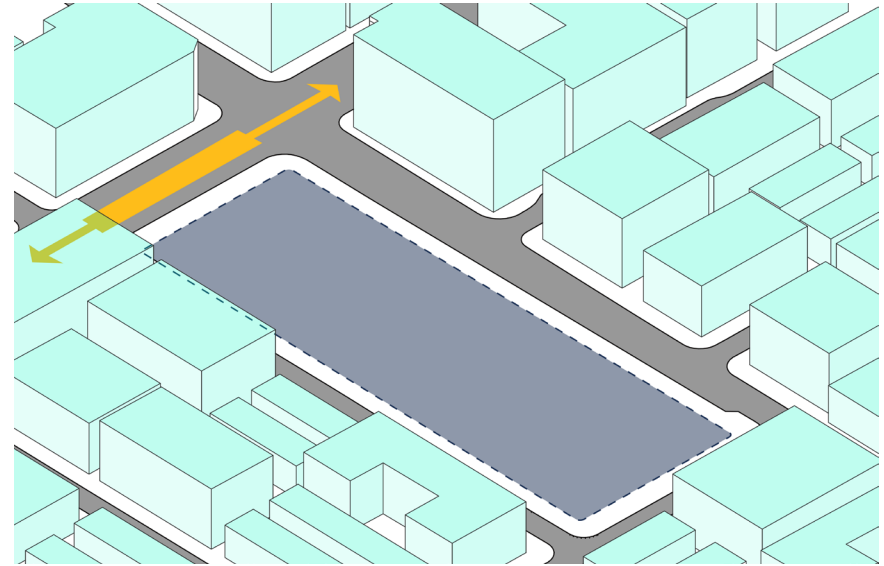


Figure 30: Context surrounding the site (in blue) in 2040. The new BRT station is shown in gold.

Using transit as a lens for density, this thesis recognizes that higher-density development requires access to amenities to make density both functional and livable, and so density should be concentrated around transit stations. From a neighborhood standpoint, the building height within a ¼-mile radius is assumed to be 150 ft. while the height limit up to 1-mile radius is assumed to be the standard NC-75 ft. found across Seattle. The 150 feet height limit is derived from the height of the most recently constructed mass timber tower constructed nearby, the 148ft Framework Building by Lever Architecture in Portland, OR (Njus). While not focusing on mass timber

construction, this thesis recognizes the potential for mass timber to more sustainability and economically help to provide density between the 5-over-2 typology typical of new Seattle development and the 20+ story towers of downtown and South Lake Union. Thus this project proposal uses the Framework building as a guide. Programmatically, ground-floor retail and commercial uses are concentrated along Aurora Avenue, as they currently are, and N 85th St with assumed residential above. Wholly residential uses with potential for live/work arrangements are then concentrated along the neighborhood streets previously occupied by SFDH. Thus the programmatic character of the neighborhood remains largely the same; the key difference is the density of those uses.

4.4 -Anticipated Users

The anticipated users of this project are families with children in Seattle who desire the amenities and conveniences living in the city can provide while simultaneously seeking for a greater sense of community typically found in single-family

neighborhoods. Though families with children are the main demographic, as stated previously, this project supports other household configurations as well and provides a range of unit types to allow a household to remain in the new neighborhood as their household situation evolves. Rather than reconfiguring the units themselves, enough variation has been provided to allow families and households to move units within the building. Additionally, neighboring residents are expected to use the retail components and the daycare, integrating the project into the daily life of the surrounding area. It is not enough for the project to support its own residents; it must also encourage interaction with the greater community as well.

4.5 -Program of Spaces

As a multi-family tower intended to provide family housing, the primary programmatic element is housing. However, in order to provide support for a range of family types and living situations within the project, the housing units span a range of sizes and types. Per the research review, ownership is a critical

component of the concept of “home”, and so a majority of the units are for-sale condos while a portion also include smaller rental units. These rental units allow for a greater diversity of families to inhabit the tower, enriching the community as a whole. 10% of the units are devoted to rental 1 bedrooms, while the remaining 90% are a range of condo sizes. Smaller 1-bedroom and 2-bedroom condos intended as starter homes for young families make up 25% of the units, and larger 3 and 4-unit condos account for 30% and 5% of the unit respectively. The remaining 30% of the units are larger 2-bedroom units. 2- and 3-bedroom units comprise most units due to the average family size in Seattle of 2.88 persons per household (US Census). While most of the units are separated from the street and accessed from within the project, functioning like a typical condo building, a small number of units are configured as townhomes with a live/work component fronting the street. A diagram of the unit massings is shown in figure 31. Overall, 150 units are provided, leading to a housing unit density of 50 units/acre, exceeding the minimum transit-density threshold of 30 units/acre required to support the surrounding transit

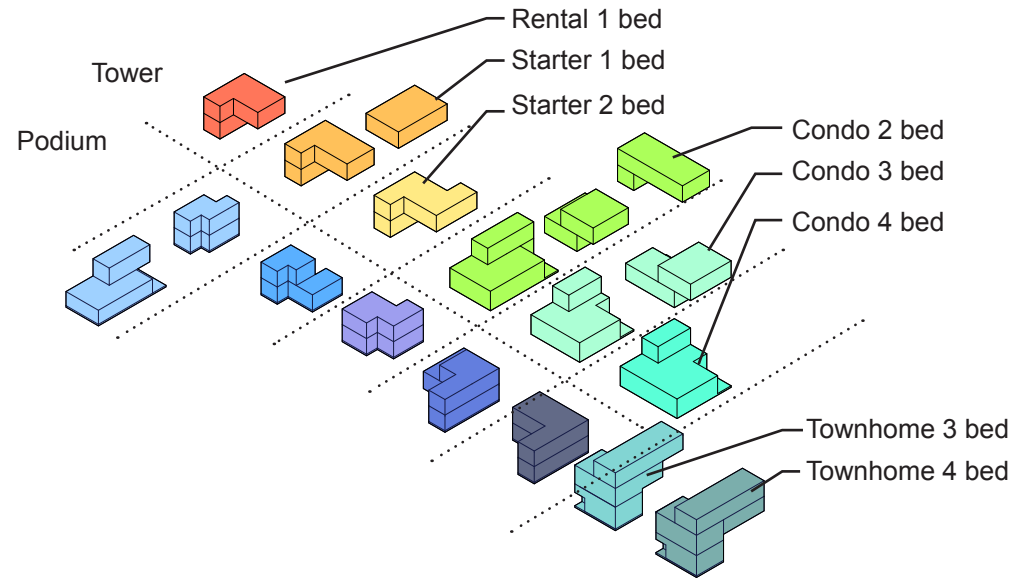


Figure 31: The collection of unit types; the units in top are located in the tower portion, while the gradient of blue are located on the podium.

investment.

In addition to the housing units themselves, the program includes a mixture of amenity spaces and areas for large community gatherings. The courtyards play a key role here, providing access to exterior play and gathering spaces. The interstitial connective tissue between the units is also an important programmatic element, designed for community inhabitation rather than solely for circulation. Furthermore, spaces are provided for commercial and retail amenities to help support an active street life while providing easy access to daily needs for residents. Space for childcare, both formally and informally, is of particular concern, and so a daycare is

CHAPTER 5: DESIGN RESPONSE

5.1 - Key Concepts

The concept of adapting key amenities of the SFDH to the multi-family tower and ameliorating key deficiencies in the design of high-density towers were the driving forces for the design decisions of this project. Key amenities identified in the research include the relationship to the street and integrating the project with the city, expanding the public/private gradient, creating a hierarchy of exterior spaces, and offering a diversity of unit types. Integrating the project with the surrounding context was particularly important because an active, vibrant public realm supports the needs of families and children, and as the city of Toronto notes, “a public realm that meets the needs of children meets the needs of the population as a whole” (Toronto). The city becomes an extension of the home, allowing children to explore, learn, and discover rather than being isolated from the city, and it allows families to take advantage of amenities of urban density. Expanding the public/private gradient helps to break down the sharp divide between public and private space typically found in multi-family

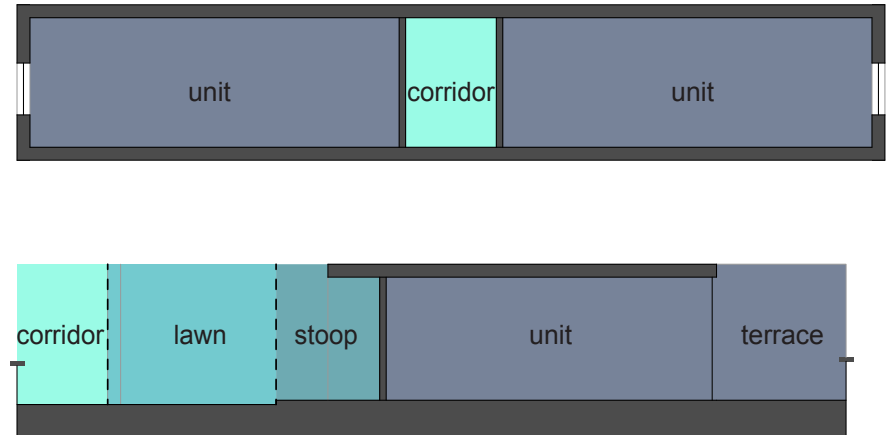


Figure 32 - Typical Multi-family Public/Private Gradient (above top) compared to the proposed gradient (above)

buildings (see figure 32), creating interstitial zones of semi-public and semi-private spaces that foster social interaction with neighbors while retaining privacy for the units (see figure 33). This expansion allows for space to meet one’s neighbors and chat about the kids rather than shuffling silently past one another in the hallway. These semi-public and semi-private zones also allow for the creation of a hierarchy of exterior spaces. Beyond providing access to the outdoors at a variety of scales, these zones also contribute to creating opportunities for social engagement between residents. More importantly,



Figure 33 - View of the expanded public/private gradient.

they create opportunities for children to play, explore, and discover beyond the typical “archipelago[s] of ‘safe’ spaces [such as playgrounds and sports courts] in a sea of adult-centric spaces” (Whizman 242). Lastly, a diversity of unit types allows a range of families and household configurations to occupy the neighborhood. Importantly, it also allows families to remain in the neighborhood when their spatial needs change; rather than relocating entirely to a new building, they can move within the building to a new unit that meets their needs while remaining in their neighborhood.

5.2 - The Podium

Given the importance of embedding the project in the surrounding context both physically and programmatically and strengthening the relationship to the street, the project is divided sectionally into two parts; the podium, which negotiates the relationship to the street and manages the relationship between the public and the residents, and the tower, which contains the majority of the residential units. The division of these two parts reflects the different roles they play at the urban scale. The podium negotiates the project’s relationship to the street and manages public/private thresholds between the public and residents while the tower only has a visual connection to the city below and thus focuses on providing units with privacy and access to light and views across the city.

The podium parti starts by creating a courtyard on the site and loading program towards the edges, activating the street and integrating the building uses with the public realm (figure 34). Next, key pedestrian paths (from the new BRT station at the intersection of Aurora and N 85th, from Nesbit

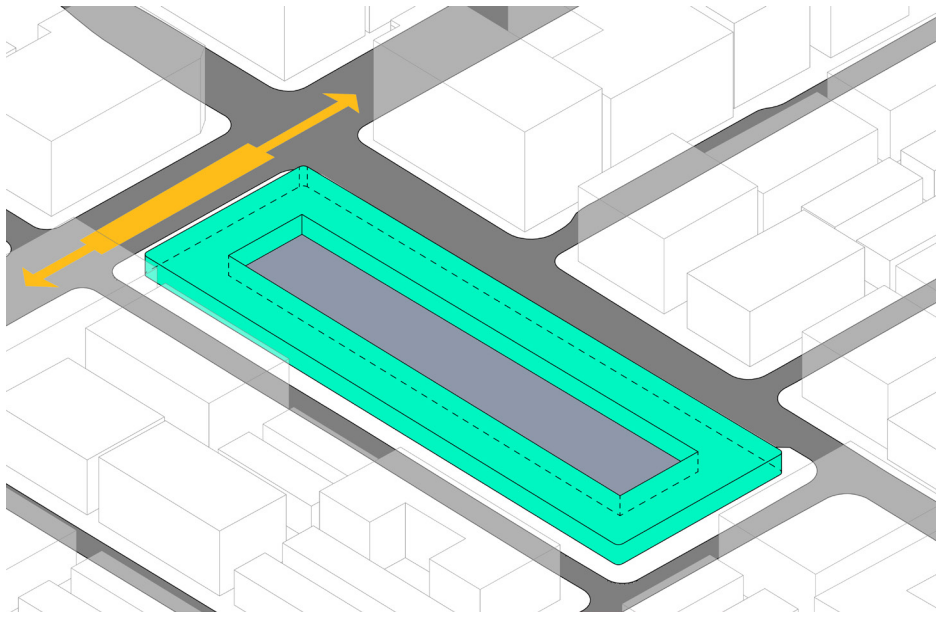


Figure 34: A courtyard is created by pushing program to the edges of the site.

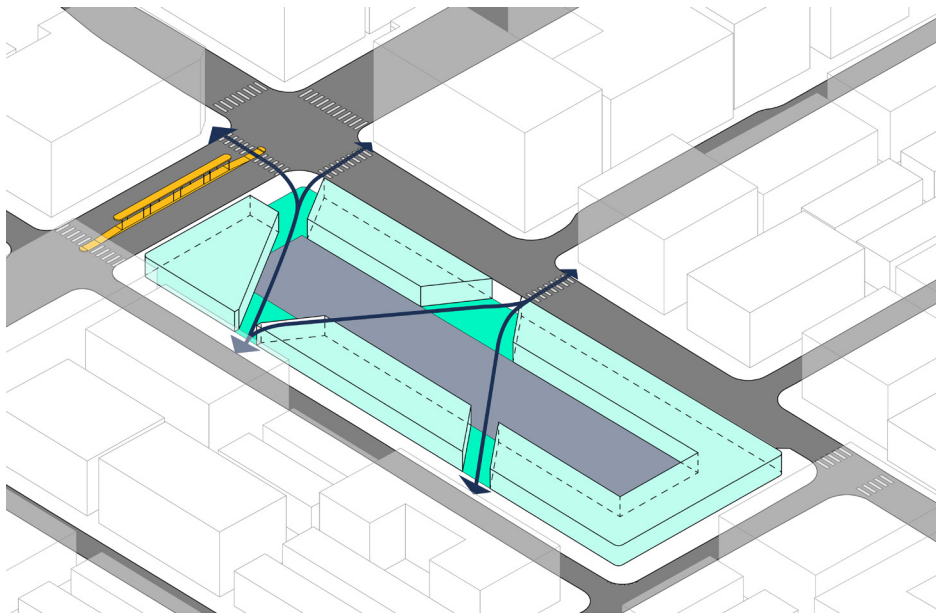


Figure 35: Key pedestrian paths carve cross-block connections and separate the courtyard into three zones.

Ave heading towards Robert Eagle Staff Middle School, and from the intersection of N 85th St and Stone Ave) carve through the site, creating access points to the courtyard and allowing cross-block circulation (figure 35). These also begin to divide the courtyard into three distinct areas. The program surrounding the courtyards responds to the neighboring context; retail and commercial space front along Aurora and 85th St while 3- and 4- bedroom live/work townhomes)front N 84th St and Stone Ave (figure 38 and 40). This retail space is envisioned as small, local retail uses with a mix of restaurants and cafes to draw neighbors to the site as well as stores that provide needed amenities for families, like a drugstore, hair salon and gym. A new daycare serves as the transition point between the small section of retail along the west side of N 84th St and the neighborhood residential areas (figure 37). The three courtyards created by the pedestrian paths are then raised above the sidewalk at varying heights based on their level of public access (figure 36). Surrounded by retail, the western courtyard becomes the most public, raised only two feet off grade to provide a clear indication of its proprietary

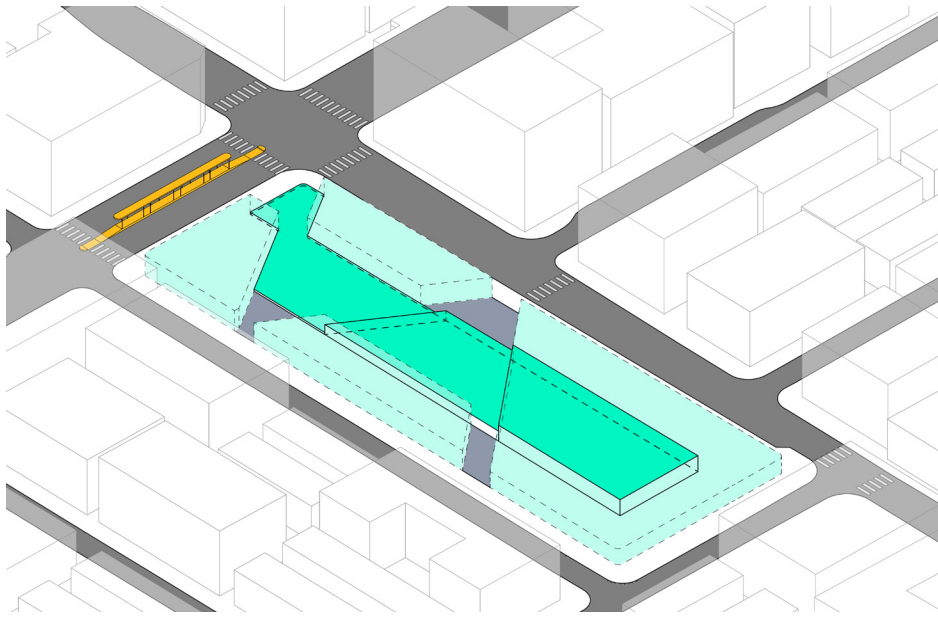


Figure 36: The three zones of the courtyard are raised up to respond to public/private nature of their program.

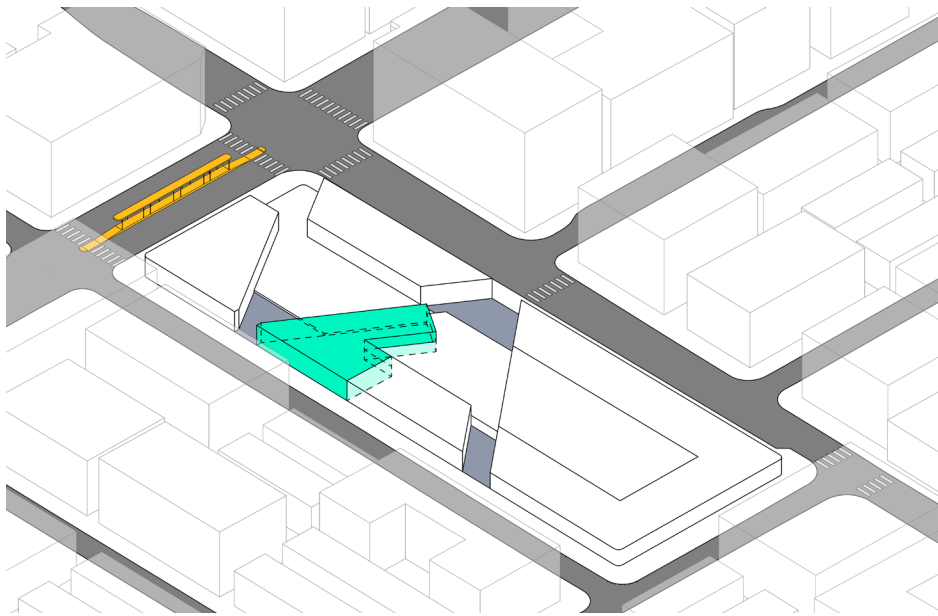


Figure 37: The daycare is located between the publicly-accessible courtyard and the play court for the daycare and residents. It also clearly demarcates the public courtyard from the private ones.

nature while maintaining easy access for passersby. Cradled by the massing of the daycare space, the center courtyard acts as a play courtyard, providing dedicated play space for the daycare that would be accessible to residents when not in use. It marks the transition between space for the public and space for the residents; this courtyard is only accessible to the daycare users and residents. Due to the more private nature of this space, it is raised ten feet off grade. Lastly, the eastern courtyard becomes the largest exterior space dedicated for use by the residents of the building and so is raised sixteen feet above grade. Additionally, units ring this courtyard, containing the space while benefiting from at-grade access to the outdoor space.

Taking advantage of the dark space underneath the raised courtyards is flexible storage space (figure 39). Here, each unit is provided with a parking-space-sized stall that provides flexible storage options for residents. It could be used as car storage or converted to a storage unit for holiday decorations and sports equipment; the exact use is determined by the residents. This is accessed by an entry

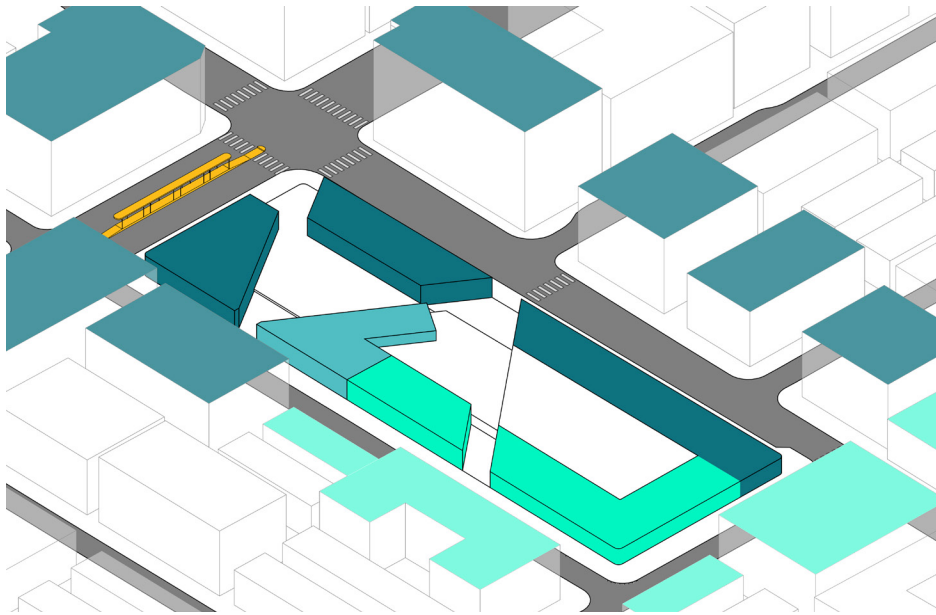


Figure 38: Program responds to neighboring uses: ground-floor retail shown in dark teal and residential shown in mint green. The daycare marks the transition between the two program types.

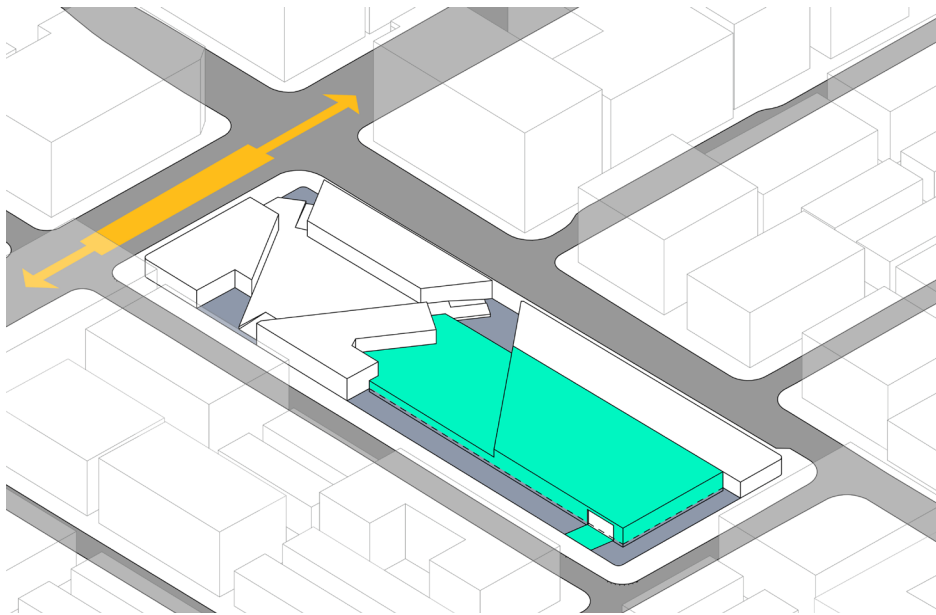


Figure 39: Flexible storage for residents is tucked under the raised courtyards.

gate on the southeaster corner of the site, utilizing a gap in the arrangement of the townhomes as they turn the corner. Lobbies leading to the vertical circulation cores mark the courtyard entrances except at the most public corner near the Aurora and 85th St intersection, providing residents with a greater sense of privacy and security (figure 41). Situated on top of the retail bars, 3- and 4-bedroom residential units are given direct access to the residential courtyard while a collection of 1- and 2-bedroom condos and starter units are accessed by a path that connects down to the play courtyard and up the units above. This path acts as an elevated sidewalk, and reconceptualizes the role of the corridor in typical multi-family developments by providing access to the outdoors while simultaneously expanding the public/private gradient (figure 42).

The architectural character of the podium emphasizes its rootedness in the site and connection to the ground plane. Dark brick wraps the retail volumes as well as the podium residential units while punched windows reinforce the solidity of the podium massing, as seen in figure 43, unifying

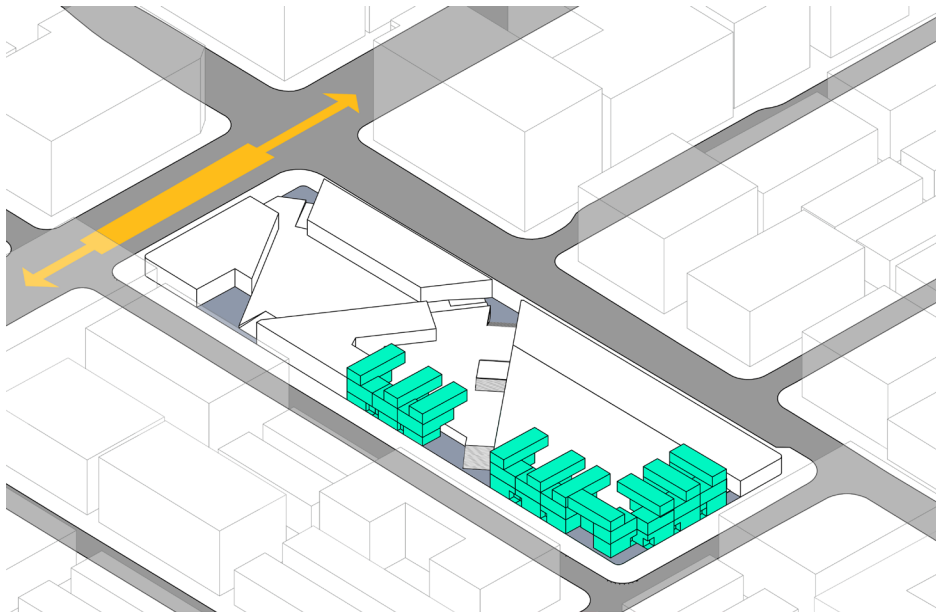


Figure 40: Townhome units mediate the sectional difference between the street and courtyard while live/work space on the ground floor helps activate the street.

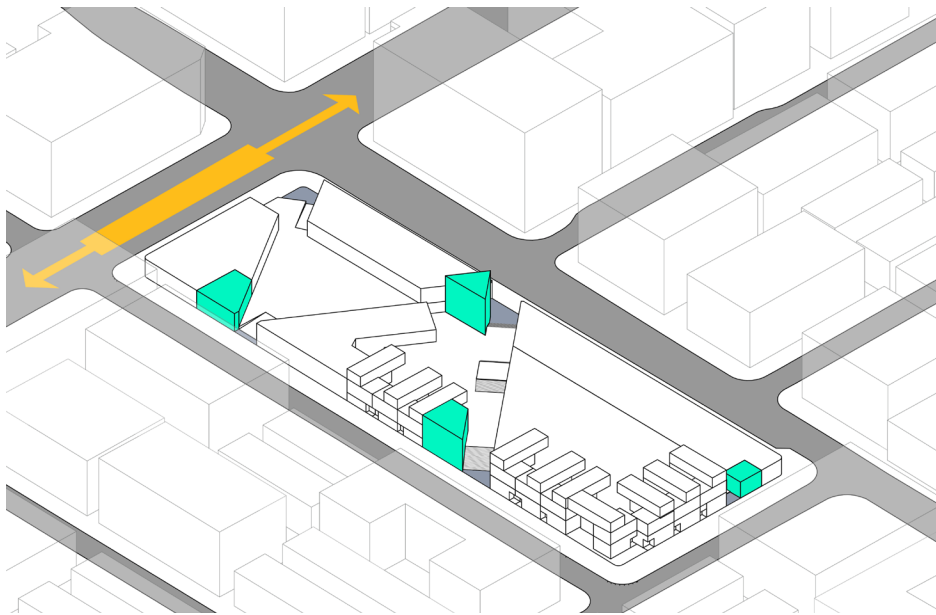


Figure 41: Residential lobbies mark the entrances portals into the courtyard.

the two programmatic elements. Despite the solidity of the brick cladding, the retail storefronts utilize plenty of glazing to allow visual activation of the streetscape. The massing of the residential units creates a transition from the solid retail massing to the pixelated units of the tower above.

The view of the public entry portal at the intersection of Aurora and N 85th St is shown in figure x. This entrance portal emphasizes the solidity of the retail mass while clearly marking a transition from the public realm to the retail courtyard. With the grade difference between the retail courtyard and the sidewalk, a platform is created that is imagined as a covered patio for the retail tenants and the public. This view also shows the connection to the new BRT station and emphasizes the imagined improvements to the streetscape that transform the public realm to a more inviting condition for pedestrians

5.3 - The Tower

Rising from the podium, the tower portion of the project holds the majority of the residential units and amenity spaces. Units are arrayed along the elevated sidewalk, replacing the

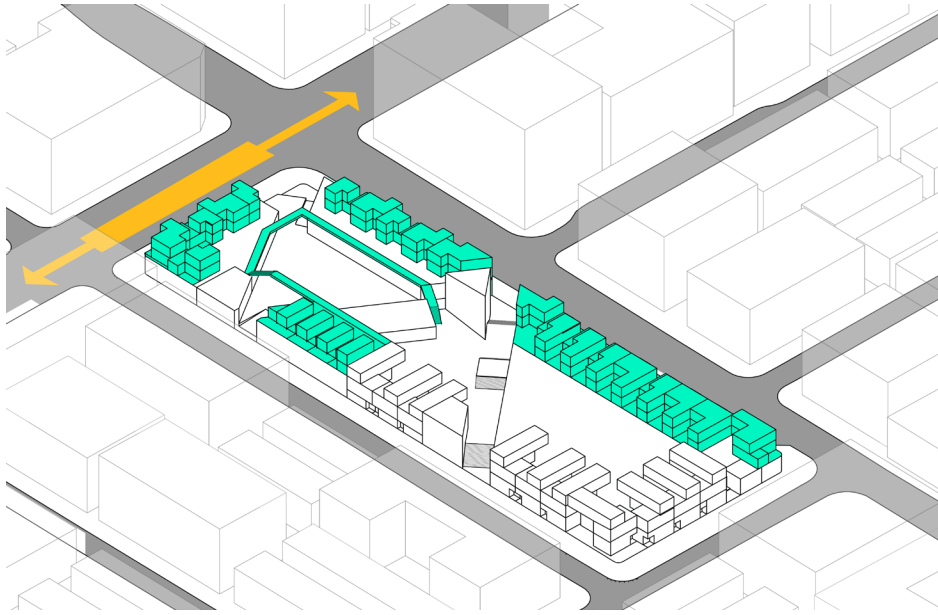


Figure 42: Residential units are placed on top of the retail while the elevated walkway begins rising from the play courtyard to connect to the units in the tower.



Figure 43: View of the main public entry from the NE corner of Aurora and 85th looking SE.

corridor in a typical multi-family project and connecting to the vertical cores that are extruded up from the lobbies below (figure 44). The elevated sidewalk is a continuation of the path from the podium below, providing a continuous connection from the units in the sky to the courtyards at the podium level (see figure 45). Just as with the podium units, all of the sky units are accessed off of the elevated sidewalk, providing each unit with its own individual, private entry from the outside. In addition to the path along the exterior of the courtyard, the sidewalk has a cross-courtyard connection following the boundary between the retail and play courtyard. This provides more inter-level connections, encouraging social interaction among residents while also offering the opportunity to occupy the courtyard space sectionally. Additionally, the location helps reinforce separation of the public and private courtyards by containing the space vertically as well as horizontally.

Structurally, a series of steel and concrete columns rise from the podium, supporting a series of platforms that in turn supports 3-story clusters of units and the elevated walkway (Figure 46). Utility chases for water and waste are attached

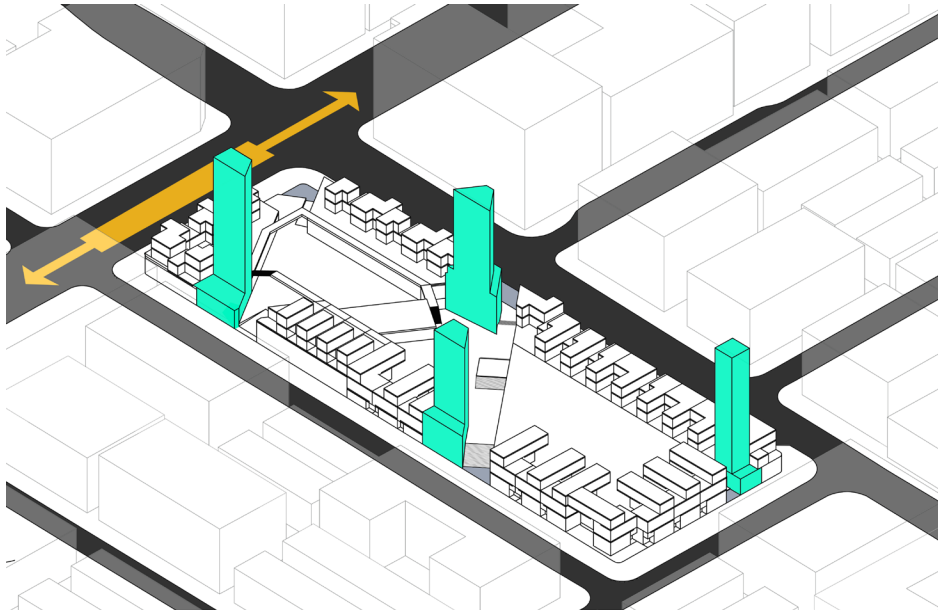


Figure 44: Vertical circulation is extruded from the lobbies below.

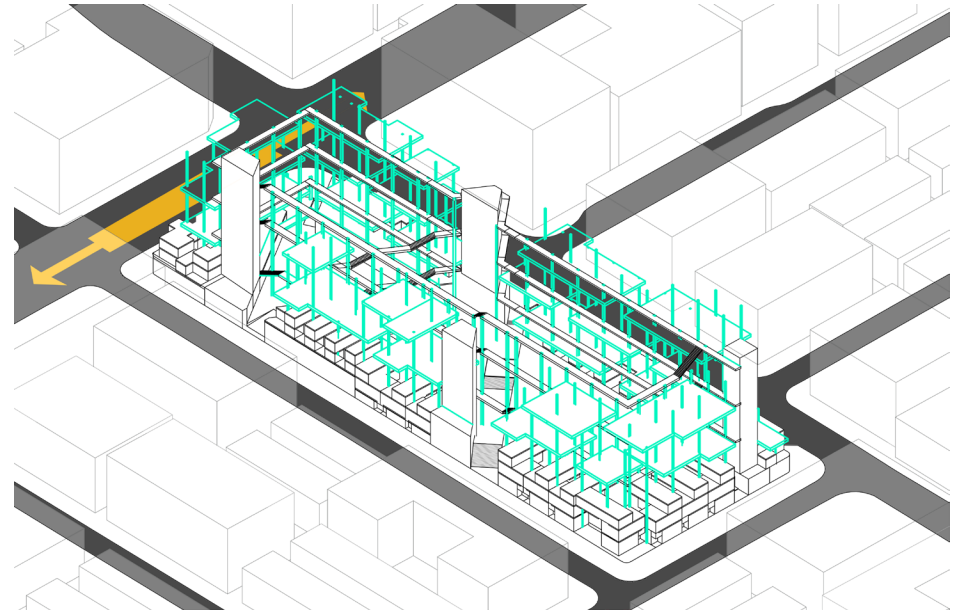


Figure 46: A series of columns and structural platforms support the groups of units and walkways.

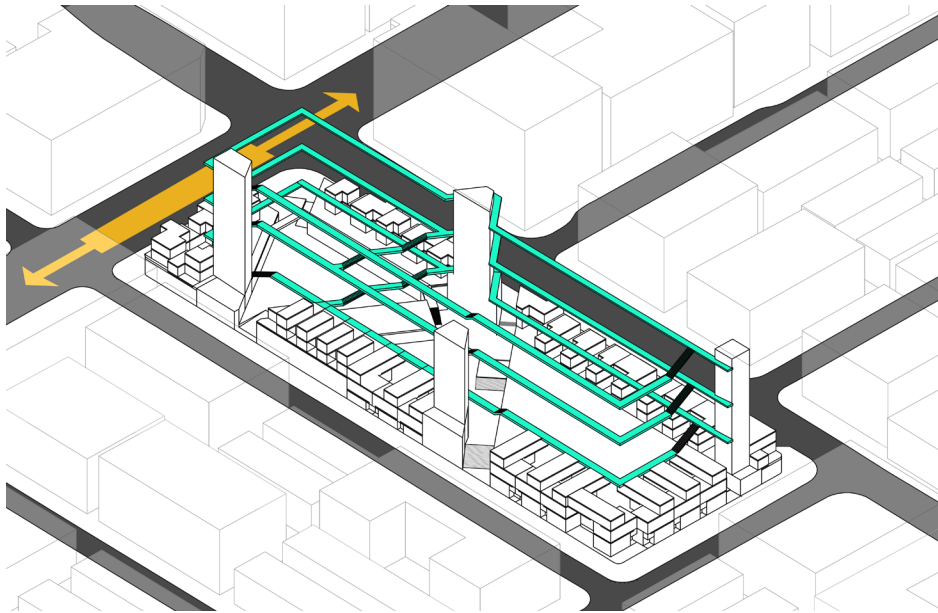


Figure 45: The elevated walkway winds up the interior of the courtyard, connecting the units and vertical cores together.



Figure 49: Units are arranged in a mosaic on the structure to support the mixing of residents while allowing porosity in the massing.

to the central columns while electricity is supplied from the walkway.

Lastly, a mosaic of units are attached to the armature provided by the structure and circulation. Units are organized into 3-story clusters of no more than six units, accessed from the elevated sidewalk on the middle level, as seen in figure 49. Larger units are concentrated towards the lower levels to provide easier access to the courtyard and to foster social interaction between families with children and support a sense of community. Smaller starter units and rental 1-bedroom units are located more on the upper levels to take advantage of the views and provide some separation from the more children-focused units on the lower levels. The array of unit types and sizes provides housing for a diverse array of family configurations and financial situation, contributing to the creation of a diverse vertical neighborhood. Along the north-western corner, units stack up to 12 stories while the southern segment of the project rises to 10 stories to allow more light to penetrate into the courtyard. Additionally, porosity is created by the stacking configuration of the varying unit massings that

allow more light, air, and views to permeate into the courtyard.

5.4 - The Cluster

In order to break down the large scale of the project, the units are organized into clusters of no more than six units; these clusters are then arrayed along the elevated sidewalk with gaps between them. This creates a smaller scale to encourage residents to meet and get to know their neighbors while also inducing porosity in the overall building massing. As seen in figure 50 and 51, additional porosity is generated by the stacking of individual units within the clusters through the varying shapes of each unit. The stacking logic utilizes the larger 2- and 3-bedroom units to form the base of the cluster, supported by a structural platform; the rest of the units in the cluster are able to support themselves stacking on one another while other clusters above are supported by their own structural platforms. The roofs of the lower units then create a front lawn space that serves as a buffer between the elevated sidewalk and the unit entries. All units are entered from the middle level, with most units having their main living spaces

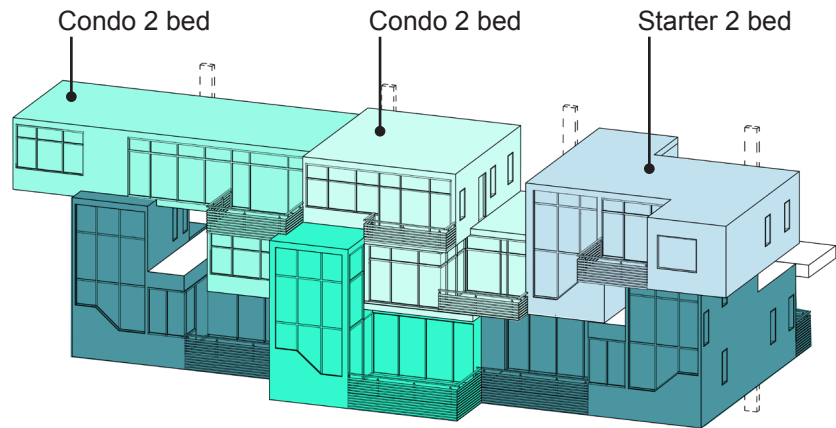


Figure 50: A typical cluster of stacked units; view facing outward to the city.

either above or below the entry level, figure 50. To help induce variety, a small portion of units, such as the Condo 2C shown in figure 50, have their main living space on the entry level, but these are in the minority.

As seen in figure 50 and 51, the architectural characteristics of the units and the cluster shift in relation to the direction of the courtyard; the side facing inwards towards the courtyard and elevated walkway has more punched windows and solid walls to preserve unit privacy while still allowing a visual connection to the front lawn and elevated sidewalk while the side facing outward has a more glassy expression to take advantage of the increased privacy and views across the city below. The sides offer a third character, remaining mostly solid with narrow, vertical windows angled either towards the courtyard or to the city views. These help ensure privacy from neighboring units while allowing more light and slivers of views into the unit. The façade itself is clad in thin wooden strips, as seen in figure 53, while the metal of the mullions and frames are a black aluminum to contrast the wood. These materials help give the mass a more

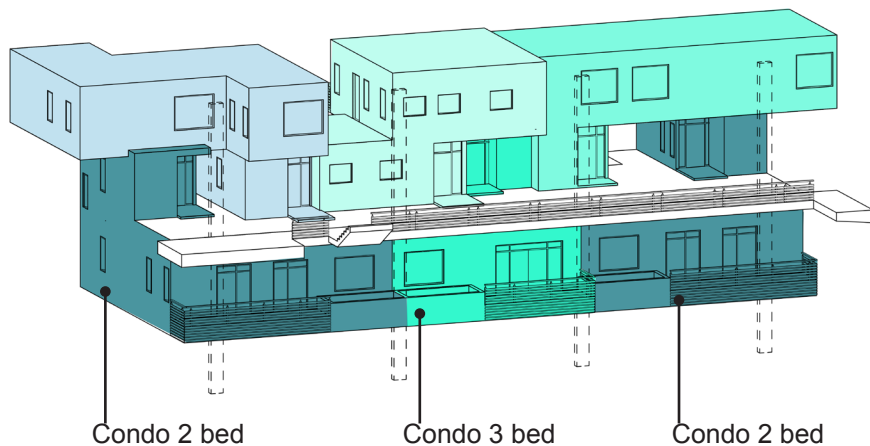


Figure 51: A typical cluster of stacked units; view facing inwards to the courtyard.

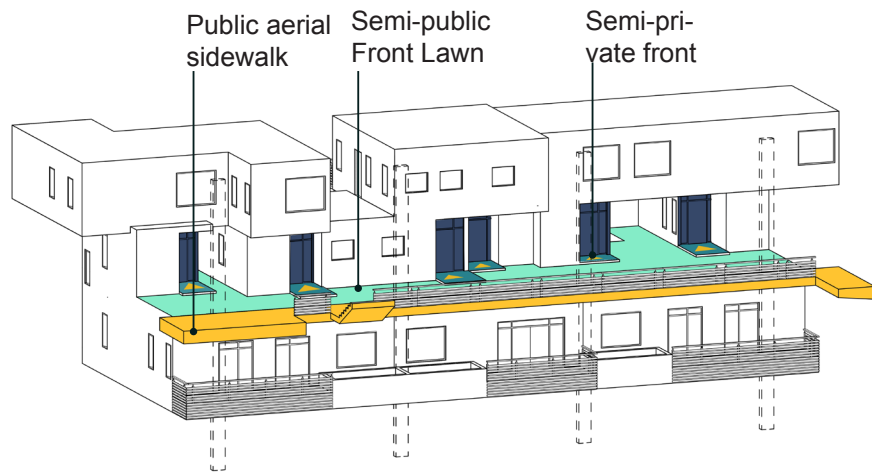


Figure 52: Public/Private Gradient Diagram; elevated sidewalk in gold.



Figure 53: View of elevated walkway and front lawns

human scale while also introducing warmth to the project to offset the concrete of the structural columns and platforms. Keeping the façade material the same across all units allows the personalization of the units by residents to become highly visible. Rather than providing unit identity and personalization through architectural expression, the architecture becomes a backdrop for personalization through the lives of the residents. Lastly, it helps reinforce the difference between the podium below with the contrasting material palette, as seen in figure 43.

The expansion of the public/private gradient is most clearly expressed through the creation of the front lawn from the roofs of the lower units, as shown in figure 50 and 51. The typical corridor of a multi-family building is transformed from a stark public/private dichotomy into a softer transition from the public (within the residential community) elevated sidewalk through the semi-public front lawn to the semi-private stoop to the private interior of the unit and back to the semi-private outdoor space (figure 54). This front lawn becomes an occupiable buffer between the unit and the community, a

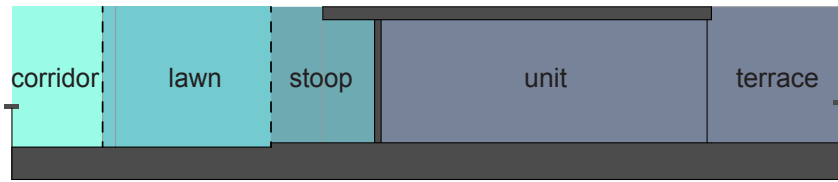


Figure 54 - Typical Multi-family Public/Private Gradient (above top) compared to the proposed gradient (above)

space for kids to play and for people to meet their neighbors. These interstitial spaces become important areas that allow for informal social interaction and provide children with spaces to explore and discover along the elevated walkway. Additionally, the structure helps reinforce this idea by marking the permeable boundary between the elevated sidewalk and the front lawns, as seen in figure 53.

Importantly, the expansion of the public/private gradient and the porosity induced by the unit stacking work together to create a hierarchy of exterior spaces. In addition to the podium courtyards, the front lawns become an important space to access the outdoors and allowing space to potentially grow flowers and other small vegetation. Additionally, the porosity of the stacking allows for exterior patios that face both inwardly toward the courtyard and outwardly toward the city, as seen in figure 50 and 51. The courtyard patios on the lower level units



Figure 55: Lower level cluster plan

encourage visual interaction with the courtyard while also including integrated space for planters that provide a privacy buffers between the units. These varied exterior spaces offer residents multiple ways to access and interact with the outdoors, expanding the ability of families and children to interact with the environment.

5.5 - The Unit

The units presented here, shown in plan in figures 55 to 57, represent the typical features found across all units, even though the actual arrangement of other units may be different.



Figure 56: Entry level cluster plan

As evidenced by the research, families do require bigger units than typically provided in multi-family projects, and so all of the units are larger than typically designed. The units here range from 1,000 square feet for a starter 2-bedroom condo up to 1,700 square feet for the 3-bedroom condos. This provides families with more space to allow “space for living with – and apart – from others” while also allowing for more opportunities for storage and in-unit laundry(153). Continuing with the concept of expanding the public/private gradient, all units have a thickened public/private threshold, a landing spot at the front entry with bulk storage for large items like strollers

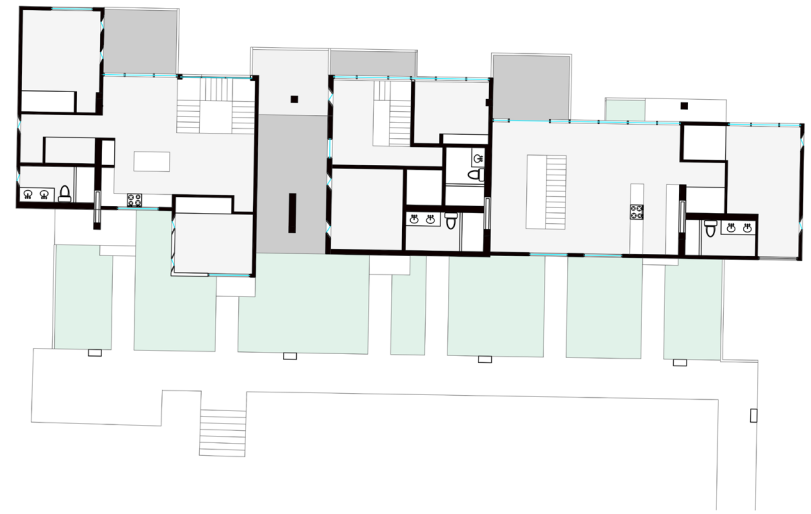


Figure 57: Upper level cluster plan

and bulky winter gear while also providing built-in seating to ease the transition between inside and outside. They are also organized to celebrate the movement from the entry level to the main living area; double-height spaces facing the city allow ample natural light while also allowing the sectional qualities of a two-story unit to be experienced by the residents, as seen in figure 58 This interior rendering also shows how the exterior terraces are integrated into the unit and provide excellent views of the surrounding city. `



Figure 58: Interior view of 2-bedroom condo, looking south

CONCLUSION

From the beginning, this thesis has sought to explore the relationship between the urban environment and the people who inhabit it; in particular, how cities can, through the design of housing, encourage families with children to remain rather than relocating to the suburbs. Through the analysis of Seattle's demographic and development data, it became clear that the separation between urban density and family housing is a pressing issue in cities like Seattle, and that rethinking the design of the multi-family typology was a method to address this. Analysis of the single-family detached house sought to understand both the physical and socio-cultural amenities single-family detached housing provides families while analysis of the multi-family typology sought to understand the social and physical challenges of this building type. Finally, research into the needs of families in urban housing sought to uncover particular considerations for families in higher densities. This research led to the concept of hybridizing the amenities of the SFDH with the multi-family typology in order to create a new approach to housing families in the city.

Utilizing a series of mapping exercises overlaying

demographic data, family-oriented amenities, and a new transit system proposed by the Seattle Subway Vision Plan, the project site was located on the southeastern block at the intersection of Aurora Avenue and N 85th Street in the southern portion of the Aurora-Licton Springs Urban Village. The site helps to strengthen the thesis argument of increasing density outside of the downtown core while also resisting the current trend of replacing family-oriented units with individual-oriented units.

At its core, this thesis seeks to reunite the concept of family-housing with the concept of urban density, two ideas currently divorced from each other both programmatically and spatially in current development patterns in Seattle. It is no longer enough for just a small percentage of the city's developable area to absorb the bulk of new development; preserving vast swaths of low-density SFDH is no longer a viable strategy for this rapidly growing city. While the building design is just the beginning of this process, the idea of hybridizing SFDH amenities with multi-family projects presents an essential method for helping address the divide between family housing and urban density.

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