

**regulatory paths to a more diverse housing stock:
encouraging family-sized, single-stair apartments in
Seattle's single-family neighborhoods with the
Urban Residential zone**

Emily Pressprich

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committee:

Daniel B. Abramson

Rick Mohler

program authorized to offer degree:

Department of Urban Design and Planning

University of Washington

Abstract

Regulatory Paths to a More Diverse Housing Stock:
Encouraging Family-Sized, Single-Stair Apartments in Seattle's
Single-Family Neighborhoods with the Urban Residential Zone

Emily Pressprich

Chair of the Supervisory Committee:

Daniel B. Abramson

Department of Urban Design and Planning

This thesis begins a two-part project, continued in my Master of Architecture Thesis, "Family-Sized Housing in Single-Stair Buildings: Testing the Urban Residential Zone." Both documents explore the implementation of a new zoning designation in Seattle that would introduce single-stair, point access, small apartment buildings into the city's existing single-family neighborhood, with the intention of creating more family-sized rental or condo units, and a greater variety of housing generally. The urban planning portion of the project, in this document, explores the need for, and creation of this new zone.

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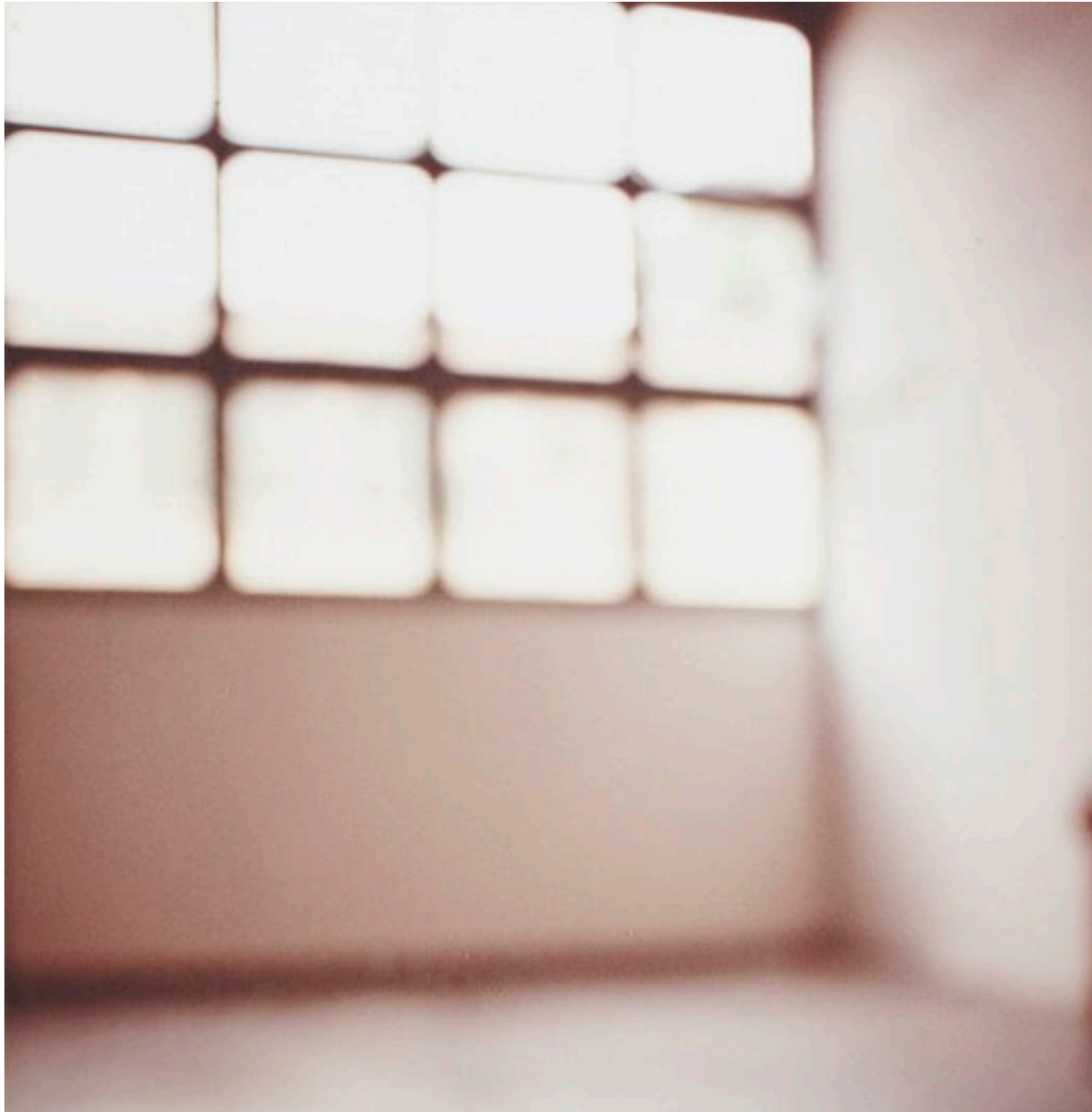
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1. Introduction

thesis introduction

Much of the country is currently experiencing a housing shortage (Schaeffer 2022). In Seattle, this issue is felt by aspiring home buyers, renters, and the unhoused people who suffer the most from this failure to provide what should be a basic human right. The housing supply issue is a deeply complex problem with no simple answer, but in order to fix any problem, one must first try to understand it. This project was formulated out of my own desire to understand some of the factors contributing to the state of Seattle's housing supply, in order to better position myself to work towards housing for everyone in my professional career.

This project focuses on single-stair buildings, and their use in creating more family-sized rental housing as well as a wider variety of housing, as an entry point into the larger housing discussion. Single-stair buildings, which are a type of point access building (PAB), are commonly built in Europe, where I have observed that they help families to live in dense, urban areas as a default rather than an exception. As it stands, most of Seattle's family-sized housing takes the form of single-family homes, which do not provide the level of density required to supply enough housing for a city of this size. This project proposes single-stair buildings as a denser, middle housing alternative, investigating their use as a superior family-sized housing typology in Seattle. I will explore how they fit into the city's existing and future regulatory framework, and present potential opportunities to encourage them more broadly.

Why families?

Rather than approach the housing issue generally, seeking one-size-fits-all solutions, I have chosen to focus on the specific need for more family-sized housing for several reasons. There is a need for more affordable housing of all sorts in Seattle, but there is no single answer for this need partly because no single housing type or price point will serve everyone. A diversity of housing types is needed to serve a diverse population with a wide range of incomes and needs.

Affordable, family-sized housing has been specifically noted as deficient in Seattle. Most of the city's larger units are single-family homes ("Neighborhoods For All, Executive Summary" 2018) ("Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle" 2014). As of 2023, an annual income of approximately \$215,000 is needed to afford the average single-family home in Seattle, however, average income in the city is only about \$127,000 (Lazarus 2024). This forces families to overspend on housing, or move out of the city entirely. Many families may wish to live in urban areas to enable car-free lifestyles; have access to a wider variety of entertainment, art, and culture; stay close to employment and friends; or any number of other reasons. When families leave a city, commutes and traffic increase, and schools suffer ("Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle" 2014). It could also be argued that a city with children is a safer, more joyful city. Cities and families have a mutually beneficial relationship that should be more widely accessible.

The other reason to build more housing for families, as well as everyone else, is to encourage the environmental benefits of dense, urban living. Keeping people close to jobs, entertainment, and each other reduces the need for driving and creates opportunities to share space and resources (Owen 2004).

For these reasons, as well as the sake of creating a manageable framework, this project will relate the larger regulatory and spatial context back to family-sized units. However, many of these explorations are still widely applicable to the larger housing discussion, and are valuable in understanding the challenges of creating more affordable housing for everyone.

A two part project:

This thesis is one half of a larger project encompassing both urban planning and architectural concepts. The second half of this project can be found in the architecture thesis, "*family-sized housing in single-stair buildings: testing the Urban Residential zone*," in which I explore potential design outcomes within the proposed zone, as well as attempt to understand the financial feasibility of these buildings (Pressprich, 2024). These explorations informed possible changes or additions to the work done in this thesis, illustrating how design work can and should be used to write better policy and regulations.

Housing is a spatial manifestation of its regulatory, social, and economic context. The housing shortage can be difficult to fully understand because it spans so many disciplines. A well informed and productive discussion of housing will, therefore, be multi-disciplinary. This appreciation for an interdisciplinary approach comes from personal experience. When I was working in architecture after my undergraduate education, I observed the influences that land use code had on what was built. When I went on to investigate the roots of the housing shortage, it quickly became apparent that urban planning played a large role. Upon returning to school, I chose to pursue both an urban planning and an architecture degree because I believe both are necessary to understand the housing problem, and to make better cities.

I also observed that these two disciplines rarely intermix at a person to person scale. In order to make progress on this issue, we will need to spend more time talking across multiple disciplines, even beyond architecture and urban planning. I have attempted to treat this project as a venue in which to bring experts from multiple disciplines together and mix their ideas in ways that might begin to blur the lines. The only solution to the housing shortage, and in turn, better cities and better lives, is an interdisciplinary one.

research questions

This project is premised on a theory that single-stair buildings either can or will produce units with a higher proportion of exterior wall area to interior volume, which may in turn produce units with better access to light and air. This higher proportion of exterior wall area provides at least the possibility for more windows, which is a major benefit when designing multi bedroom units. The potential for more bedrooms, coupled with the limit on units per floor in single-stair buildings in the Seattle building code, should result in more family-sized units. A primary question of this thesis is if the midrise single-stair point access buildings (MPABs) that are built in Seattle actually produce family-sized units.

The second question this thesis explores is how MPABs fit into the existing regulatory framework, and how upcoming changes to the city's comprehensive plan will affect the implementation of this building typology. This question is also used to explore current and upcoming regulatory barriers to building more housing units, particularly larger units.

Finally, in response to the regulatory investigation, this thesis will propose a definition for a new zone with the intention of seeing more family-sized units built, in MPABs, at the edges of single-family neighborhoods. Through this proposal, the effects of standard zoning regulations on massing and unit sizes will be explored with the goal of encouraging regulations that are more intentional about the individual living spaces they produce.

project framework

The existing knowledge on MPABs, and the context they fit into will first be explored through a literature review. Next, this thesis presents a typological survey of all the MPABs that have been built in Seattle in the last decade, found through the use of Seattle's construction permit data. This survey will end with a discussion of the characteristics of more typical midrise residential buildings. In response to this, the existing zoning that affects these buildings will be summarized, followed by a discussion of anticipated changes to Seattle's land use regulations, as proposed by the comprehensive plan update taking place at the time of this project. This discussion will widely explore the effects of these changes on future housing production in Seattle, and relate these effects back to MPABs and the city's need for more affordable family-sized

units. These chapters will form a contextual basis for the regulatory changes this thesis proposes.

The second half of this document consists of a survey of Seattle's existing Neighborhood Residential lots, their sizes, and counts. This provides a basis to begin to explore how more units might fit onto these lots through the use of MPABs. These explorations will inform the proposed new zone, which will serve as the starting point for the other part of this project, contained in the accompanying architecture thesis. I will conclude this part of the project with a broad discussion of potential regulatory changes that could promote more affordable family-sized housing in Seattle.

The final section of this document will reflect on the project as a whole, including a discussion of some of the more important takeaways from the architecture thesis. This project has come to illustrate one of the primary reasons I chose to pursue both of these degrees: zoning code can benefit from architectural thinking. Not only should the profession that must follow so many of these regulations be given the chance for feedback, but maybe more interestingly, interdisciplinary collaboration and design thinking might bring new opportunities and solutions to the planning profession.

2. Literature Review



There is very little existing literature that directly discusses MPABs, besides work done by architect Michael Eliason. His work was foundational for this project. The adjacent literature covers topics including building types, construction types, fire code, affordable housing, the economics of building taller buildings, and designing apartments for families, among other things. Within the literature discussing different apartment types, it is generally agreed that double loaded apartment buildings produce predominantly single aspect apartments that are not appealing to families and are not conducive to cross ventilation. Relevant economic and construction sources indicate that building taller buildings is more cost effective but only to heights that can still be achieved with less expensive construction methods such as stick framing. Minimal research has been done on the fire safety of MPABs, however, Eliason and others have concluded that single-stair buildings are as fire safe as similar, multi stair buildings, assuming the correct fire precautions are taken (Eliason 2021).

background:

In 2023, architect Michael Eliason wrote a policy brief summarizing key points of an earlier paper. In this policy brief he urges other cities to adopt Seattle's legislation allowing tall point access housing blocks (Michael Eliason 2023). This brief white paper spawned a flurry of urbanist news articles agreeing that this typology should be used more widely in the United States, but so far, the conversation has not seen many results.

In his earlier paper, *"Unlocking Livable, Resilient, Decarbonized Housing with Point Access Blocks (2021)"*, written for the city of Vancouver, BC, Eliason argued for the implementation of policy changes that would allow for the construction of tall point access housing in that city. He asserts that this type of building provides "compact, low-carbon, and livable multifamily housing." Vancouver's building code, like many building codes in North America, does not allow point access housing above two or three stories, depending on unit configuration. Eliason outlines the many benefits of this building type, including increased livability through double aspect units, quieter bedrooms, cross ventilation, and family-sized units; social opportunities created by inviting central stairways and more compact circulation; lower embodied and operation carbon through denser development, passive cooling, and construction methods; and more compact and flexible floor plans which could allow for more accessible units. He also addresses the question of fire safety that is often brought against these buildings with the example

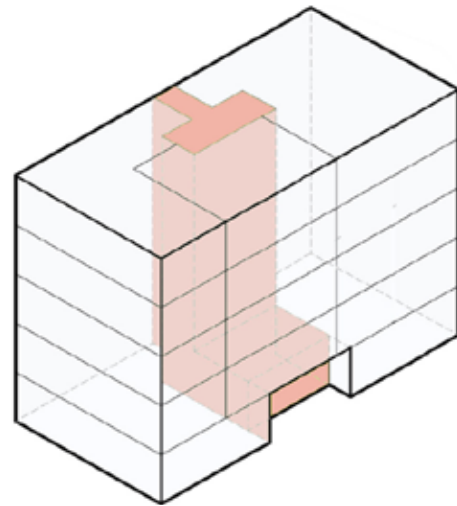


Figure 1: isometric view of MPAB massing (Michael Eliason 2023). Point access circulation highlighted in pink.

of Germany, which limits building heights based on rescue ladder extents. Eliason goes on to discuss model building codes from other cities and case studies of successful built projects that exemplify the building type, including projects in Seattle (Eliason 2021).

After Eliason's original paper, Conrad Spreckert created a website as his thesis to explore the challenges to building point access housing in Canada, and to propose new regulation based on those of cities across the world that allow the typology with less constraints. In Canada, tall point access buildings are not allowed per the National Building Code. Spreckert points to Seattle and other cities that do allow them as models to learn from. His underlying assertion is that these buildings are beneficial in providing middle housing and should be widely permitted and constructed (*"A Wicked Problem — The Second Egress: Building a Code Change"* n.d.).

Seattle has become the model city for advocates of the MPAB, however, a brief investigation of recently constructed buildings in the city indicates that they are not commonly built (*"Seattle in Progress"* n.d.). Before we propose the adoption of Seattle's code changes, it may be beneficial to investigate why it has not spurred substantial construction of these buildings.

housing in America:

An analysis of American Housing Survey data done by Brian Potter for his web page "Every Building in America" finds that the US housing supply is composed of roughly 100 million single-family homes, and 5.2 million multifamily buildings containing 40 million housing units. The vast majority, 90 percent of all buildings across sectors, is single-family housing. In terms of square footage, single-family homes account for 200 billion square feet, and multifamily accounts for 36 billion. Most multifamily housing is in smaller buildings of fewer than 20 units. Approximately 75 percent of the country's housing stock is single-family. Nearly 70 percent of residential structures are one or two floors, 22 percent are three floors, and four or more stories make up the remaining 8 percent. Interestingly, when considering living units in multifamily housing, there are roughly equal unit counts for each of the different building sizes, i.e. there are fewer buildings with fifty or more units in them than buildings with ten to nineteen units in them, but there are about the same number of living units across all buildings in each category. The average single-family home size is roughly double the average multifamily home size. Most multifamily units are 500 to 1,500 square feet with the distribution being a bell curve peaking at roughly 900 square feet (Potter 2020).

The vast majority, 90 percent of all buildings across sectors, is single-family housing.

Potter's analysis confirms what almost any US citizen over the age of twelve could tell you; that the vast majority of people in America live in a single-family home. This is the outcome of decades of legislation and economic policy that have encourages and subsidized home ownership. From the Home Mortgage deduction to the structuring of property rights to favor land ownership, the U.S. housing system has been

set up to favor the single-family home. Traditionally, apartments have been viewed as a stepping stone to home ownership. It is assumed that people will rent while they save for a down payment, and buy their first house as soon as they start a family. Recent generations are finding this narrative less and less economically feasible though, due in large part to the ongoing housing shortage in the U.S. It is more typical now that families and individuals will continue to live in apartments well past the ages that their parents did so. This shift in living patterns has put pressure on families to delay having children, or to leave urban areas in search of family-friendly housing. The current housing stock is not meeting our needs anymore.

housing affordability and regulatory barriers:

Why is there a shortage of affordable housing in a wealthy country like the United States? Why can't people afford housing in Seattle, where the median household income in 2022 was over \$115,000, 155% higher than the national average ("Most Populated U.S. Cities: Median Household Income 2022" n.d.)? Studies of affordability and homelessness indicate that these patterns are the product of a lack of supply coupled with increasing income inequality (Colburn and Aldern 2022).

Seattle has struggled to meet the housing needs of its citizens in large part because of its economic prosperity. A strong job market and increasing wages at the high end of the spectrum puts pressure on the region's housing market, which has not kept pace. Pressure at the top of the market has resulted in those at the low end being priced out (Maritz and Wagle 2020).

The lack of housing supply is attributed in large part to regulatory constraints, especially of the construction of multifamily housing. In 144 suburbs of metropolitan areas, the zoning from 1990 to 2000 was found to limit the construction of multifamily housing units bellow market demand. It was also found that the zoning of these

suburbs was related to the distance from the inner city as well as the racial demographics of the neighborhoods during the 1960's (Chakraborty et al. 2010). Restrictions such as these have constrained the building of multifamily housing in established urban areas for years, contributing to the current shortage. This thesis is in part motivated by the need to build more housing, at all income levels, and the need to lower barriers to doing so. However, there are still those who are skeptical that building market rate housing will positively impact housing affordability.

In 144 suburbs of metropolitan areas, the zoning from 1990 to 2000 was found to limit the construction of multifamily housing units bellow market demand.

Vicki Been, Ingrid Gould Ellen, and Katherine O'Rogan use both theoretical and empirical evidence to address what they call "supply skepticism." This is the belief that adding additional market-rate housing will not contribute to housing affordability. The four key points of this skepticism that they address are: land in expensive cities should be devoted to affordable housing as much as possible rather than building market-rate

housing; new market-rate housing won't create a filter down effect that pushes older housing to become more affordable, at least not in a meaningful timeframe; that new market-rate housing may create induced demand, and finally that new market-rate housing will increase rents and trigger displacement in the immediate area. They cite several studies that have found that areas with less restrictive regulations also have more construction and lower housing costs. Been, Ellen, and O'Rogan find, through a review of the existing theory and research, that these concerns are either misinformed or unfounded. The evidence they cite supports the theory that adding new housing, especially in the middle of the market, will contribute positively to affordability across a city, either by reducing demand at the higher end of the market, or by depreciation over time. The authors write that the final concern, that new housing development may cause gentrification, is not well researched and findings are varied and seldom prove a causal relationship. They conclude that cities should use a range of policy tools to incentivize housing development at a range of affordability levels (Been, Ellen, and O'Regan 2019).

It is important to note that the issue of gentrification and displacement is still controversial. It may be that the type of housing being built changes potential outcomes. If new housing primarily consists of smaller, more expensive units and is replacing larger, older, naturally occurring affordable housing, this will likely contribute to displacement in some communities. The question of causal relationships, and potential for displacement is still somewhat unclear in the literature. This project will focus primarily on adding variety to our housing stock rather than adding more housing units generally. While more housing is needed, the perspective of this project is that this housing should be added with intention so as to create space for a wide variety of people in our cities, not just the young singles that are primarily served by the addition of many small rental units. This is one piece of the larger housing issue. Ultimately, we will need to dramatically increase housing of all kinds if we are to actually fix this issue.

Gregg Colburn and Clayton Page have shown a strong correlation between the unaffordability of housing and a lack of supply in their recent book "Homelessness is a Housing Problem." While individual factors such as mental health, poverty, and unemployment may make people more vulnerable to homelessness, the real drivers that contribute to large differences in homelessness between US cities are high economic growth coupled with an inelastic housing supply. If the demand for housing in a city is high but the supply of housing is inadequate or unable to keep pace with

The report calls out the use of smaller scale buildings that will fit into Neighborhood Residential and Lowrise Multifamily zones.

that demand, rents will increase and individuals at the lower end of the income bracket will become more rent burdened, making them more vulnerable and thus more prone to homelessness. Major barriers to building housing in these tight markets are geographic and regulatory constraints. While geography is, for the most part, unchangeable, regulatory barriers such as zoning, building codes, land use restrictions including minimum lot size,

height limits, FAR limits, setbacks, open-space requirements, and slow permitting, can be changed (Colburn and Aldern 2022).

Seattle has recognized the need to reduce barriers to the construction of more multifamily housing. In its report on addressing affordable housing in the 2024 comprehensive plan update, the Seattle Planning Commission notes that most subsidized affordable housing units take the form of larger apartment buildings of fifty or more units, which are only permitted in limited parts of the city, as it is currently zoned. While creating more subsidized affordable housing is absolutely a key factor in addressing the housing crisis, so is increasing the overall supply of housing. The report calls out the use of smaller scale buildings that will fit into Neighborhood Residential and Lowrise Multifamily zones. Seattle is also in need of more family-sized housing in order to retain families with children. The vast majority of units in the city are one-bedroom, with larger units only being prevalent in multiplexes, townhomes and single-family homes, which are unaffordable housing types for many households (“Meeting the Challenge: Supporting Affordable Housing in the comprehensive plan” 2022).

family-sized housing:

The Seattle Planning Commission identified this need for family-sized housing units affordable to low and middle income residents over a decade ago, in their 2011 housing report. A 2014 white paper further explored the issue stating, “Seattle values and wants to attract more families with children.” Finding ways to house families in urban areas has multiple benefits including reducing costs associated with transportation, health benefits from walking or biking, support of a robust talent pool and improved overall economic health for the city. Family-sized housing also supports a reduced environmental footprint associated with taking mass transit and living in denser housing. A more family friendly city can also be more equitable city. Family-sized housing is only one ingredient in attracting and retaining families, but it is key. As of 2009, Seattle was substantially lacking in larger apartments, with 70% of the stock being studios and one bedrooms. This has likely not changed dramatically in recent years. The Commission defines family friendly multi-unit

As of 2009, Seattle was substantially lacking in larger apartments, with 70% of the stock being studios and one-bedrooms.

housing as units with at least two, preferably three bedrooms, with enough space for family gathering, in buildings of at least 50% family-sized apartments. Midrise stacked flats are included in the Commission's list of housing types that might provide family-friendly units (“Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle” 2014). MPABs can provide this housing, but first they must be built.

[family-sized units have] at least two bedrooms and a minimum net unit area of 850 square feet

Seattle’s zoning code further defines family-sized units as those with at least two bedrooms and a minimum net unit area of 850 square feet. These units are required in LR1 zones, as described in section 23.45.512.B. This requirement does not seem to have made a substantial impact on the supply of family-sized units though. Reasons for this will be explored in the architecture thesis.

Beyond the need for more bedrooms, the subject of apartments for families with children is not well explored. In her 2011 thesis, Courtney Thomson contributes a series of case studies of affordable, family-sized apartments in Seattle, and uses her findings for suggestions in the design of affordable apartments for families with children. Thomson’s findings agree that Seattle has an especially low population of children, in part due to a lack of affordable family housing options. In her lit review, many of her sources support characteristics associated with MPABs: A majority of people are most concerned about the amount of interior space within the apartment available for family members and family activities. Families may also want to live in denser, urban areas because of the amenities and opportunities they provide. Studies done in Portland indicate a strong preference among families for apartments with three bedrooms, or at least two with a den. Vancouver, B.C. requires at least two bedrooms to be considered a family unit. Defensible space theory indicates that fewer apartments sharing spaces inside and outside of the building will result in a greater feeling of ownership and security for the residents. Fewer residents sharing circulation space will lead to a sense of shared, semi-private space and a greater likelihood of neighbors recognizing each other. Many of her sources also indicate that mid-rise apartments with larger units are one of the most efficient, affordable, and successful ways to house families with children in dense urban areas, in terms of the trade off between quality of space and cost of the housing (Thomson 2011).

middle housing:

Many of the characteristics that make multifamily housing livable for families can be found in “Middle Housing,” a term originating from architect Daniel Parolek’s “Missing Middle Housing” which refers to, “a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes (“Daniel Parolek,” n.d.) (“Missing Middle Housing: Diverse Choices for Walkable Neighborhood Living” n.d.).” Parolek refers to these housing types as “missing” because they have largely been illegal to build in many metropolitan areas for the last several decades due to zoning restrictions. One fifth of the U.S. population lives in these buildings and they have been found to be some of the most affordable housing stock available (Brian Y. An et al. 2022). The lack of middle housing construction has also contributed to the housing affordability crisis.

When the housing shortage is considered in terms of housing types, the crucial role of middle housing becomes apparent. An article in the journal *Housing Studies* used quality-adjusted hedonic regression to compare middle housing rental prices to other segments of the market. Middle housing was defined as properties of 2

to 49 units. These units were found to be the most affordable part of the overall housing stock and tend to house the lowest-income families. This affordability is only partially due to potentially lower quality of the units, and seems to be related more to a lack of interest from institutional investors who often acquire larger rental properties as a means of profit. Some types of middle housing filter down in the market faster than other housing types but generally the pattern is not typical of all middle housing types. The authors concluded that if lower rents cannot be entirely explained by lower quality or a strong filtering effect, then there must be other market causes that keep the rents down in these buildings, potentially the lack of interest by large real estate investors. By determining the factors that contribute to the affordability of middle housing, policy makers can have a better idea of whether middle housing is a valid tool for addressing housing affordability (Brian Y. An et al. 2022).

The variety of housing types provided by middle housing may also be economically beneficial for renters. In a study of the relationship between affordability, density, housing types, and land use, the author was able to find a positive relationship between neighborhoods with greater density and variety of housing, and the number of affordable rental units in those neighborhoods. Housing variety was the most strongly correlated with affordability (Aurand 2010). The study was done using data from 1990 and 2000, but likely still reflects current trends.

While many cities have been adopting new regulations to allow for more living units to be built on lots, there are still barriers to middle housing construction. These barriers include lot coverage limitations, setbacks, height limits, FAR, easements, and parking requirements. The economics of smaller typologies from duplexes to fourplexes can also be challenging when land and construction costs are high. Several builders interviewed for a report on middle housing said that typologies between eight and twelve units are more economically viable. This scale allows less expensive wood frame construction and often does not require an elevator. Complex subdivision, infrastructure, and utility rules and fees can also limit middle housing development, and inconsistent and slow permitting can cause uncertainty for small developers. These small developers often do not have access to debt and equity from large financial institutions because the sizes of these projects are considered too small to be worth the time or because middle housing is seen as a risky investment due to its relatively limited development (David Garcia et al. 2022).

MPABs are pushing the upper limit of what could be considered middle housing. Usually, this range ends at three or four stories, while MPABs refer to buildings of four, five or even six stories. They do share a common goal of contributing to dense, livable neighborhoods with a variety of housing options, and it is feasible that MPABs would be compatible with other middle housing types. MPABs also have the added advantage of fitting more units, which may be economically more appealing for developers than other middle housing types.

The economics of smaller typologies from duplexes to fourplexes can also be challenging when land and construction costs are high.

podium buildings & building codes:

Most of the multifamily buildings that do get built in the United States fall in the category of the “five over one” building typology (fig 2). This refers to the type of construction being used in the building, as defined in the International Building Code (IBC). “Five” refers to Type V construction, which is considered the least fire resistant by the code and typically consists of light wood framing, as is commonly found in single-family home construction in most of the country. “One” refers to Type I, which is considered the most fire resistant by the IBC (Frank Ching and Steven R. Winkel 2021).

The Type I construction is used in a “podium,” usually of concrete, steel, or occasionally mass-timber. The light wood framed upper part of the building is usually four or five stories, for a total of five to six stories. Relatively recent updates to the building code have allowed these buildings to reach up to seven stories (“Code Path and Requirements for Podium Projects” n.d.). The 2015 IBC update allowed for podiums to be multi-story, which allowed two-story Type I podiums with five stories of Type V above. This combination meets both a typical 85’ height limit and a 65’ seismic limit for light-frame construction (“Maximizing The Design Benefits Of Podium Construction” 2023).



Figure 2: Construction on a typical “5 over 1” podium building. Note the concrete first floor. Image taken in Rainier Beach, Seattle.

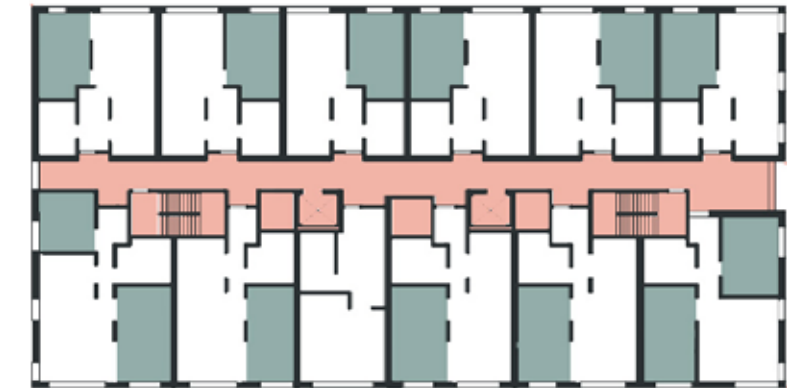


Figure 3: diagram of double loaded floor plan showing fewer bedrooms per unit (Michael Eliason 2023).

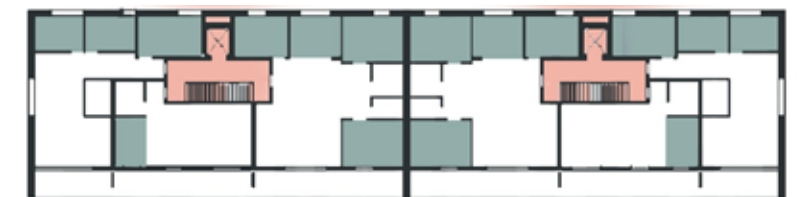


Figure 4: diagram of point access plan showing family-sized units (Michael Eliason 2023).

In response, the Seattle City Council revised the local building code in 2018 to allow up to 75 feet of wood-framed construction in addition to any concrete podium below, effectively allowing six stories of wood frame over two stories of podium to achieve 85 foot height limits or six stories of wood frame over one story of podium to achieve 75 foot height limits. The new code will require the first floor of wood framing to be of a higher level of fire resistance than is typically required for this type of structure, and the building to be divided into smaller fire containment areas of no more than 12,000 square feet each. The taller buildings may also require more structural stability to address seismic codes (Fesler 2018). While the 2018 Seattle building code update was aimed at typical podium style buildings, it may also aid in the constructibility of MPABs since these could theoretically be built entirely of light wood construction up to their code limit of six stories.

The other defining characteristic of these five over one buildings is their double loaded corridor layouts. The IBC requires two means of egress in apartment buildings, which typically means two stairwells. The logical and overwhelmingly adopted solution to this requirement is a single long hall running through the building and connecting the two stairs, with apartments to either side (fig 3). This requirement, along with five over one construction, and a propensity in most jurisdictions for requiring parking, has led to the typical American apartment building. Most renters, at some point in their lives, will live in one of these buildings, and many will agree they do not make ideal living environments.

There is a second building code, besides the IBC, used in the United States. The International Residential Code (IRC) was developed with the intention of creating a separate code for small scale residential construction to simplify the code process by cutting out irrelevant information. The IRC applies to single-family homes, duplexes, and townhouse buildings of three or more units. Buildings regulated by the IRC are limited to three stories above grade ("2018 Washington State Residential Code," n.d.).

Building codes were invented to protect the health, safety and welfare of the public. While there have been versions of building codes in the United States, the first IRC and IBC were published in 2000 by the International Code Council (ICC), which is a conglomeration of the previous three model code agencies in the United States. The idea for a stand-alone residential code was proposed by the ICC/NAHB task force, founded in 1996. This group was composed of members from the International Code Council and the National Association of Home Builders. The original drafting committee was composed of three code officials, three home builders, and three architects (Rossberg and Leon 2018) (Tyree and Pitts, n.d.).



Figure 5: Duplex near Green Lake in North Seattle.

The IBC applies to all occupancies not within the scope of the IRC. The IBC addresses structural stability, egress, sanitation, lighting and ventilation, accessibility, energy use and life safety of new and existing buildings. Similarly, the IRC covers structural integrity, fireplaces and chimneys, insulation, mechanical systems, gas supply, plumbing, and electrical systems ("2018 International Building Code (Ibc)," n.d.) ("2018 Washington State Residential Code," n.d.).

It is debated whether building codes increase housing costs, and if so, whether that cost increase is justified by the lives saved and reduction in costs incurred in fire, natural disaster, litigation, or other events. An article in the journal *Cityscape* uses a combination of quantitative analysis and empirical studies to indicate that building codes increase housing costs by 5% or less, much less than the impacts of zoning and subdivision requirements. Theoretically, building codes could increase housing costs for both single and multifamily housing through restrictions on production, use of cost-saving materials and techniques, and complications in mass-production. The restriction on production would not be intentional, but rather a side effect of administrative conflict and delays. Other cost-inflating restrictions, such as limits on plumbing materials and methods, may be more intentional, motivated by the potential for higher profit for that trade. The article, written in 2005, notes a lack of current research and data collected since the creation of the IBC and IRC in 2000 (Listokin and Hattis 2005).

Of particular interest to this project is the impact on construction costs that use of the IBC has on multifamily construction. Several of the professionals consulted for this project noted the high cost of construction, due in part to the need for more stringent fire-safety standards called for in the IBC (Khouri 2024). More research is needed on the cost-benefit trade offs of higher fire safety standards and whether these standards could be reduced partially, or completely, to IRC levels for smaller multifamily projects. Similar studies would be pivotal in spreading single-stair acceptance in building codes across the country.

It is understandable that jurisdictions would be hesitant to diverge from the standards set out in the IBC and IRC since the potential negative impacts to health and safety are so severe. Model codes are typically developed by non-profit organizations to be adopted by jurisdictions as needed, because most jurisdictions lack the resources to develop their own codes (Rossberg and Leon 2018). Most cities in North America, especially smaller jurisdictions with limited staff, adopt the model codes with few to no changes. It is for this reason that most U.S. cities do not permit MPABs. The acceptance of course, is Seattle.

The Seattle Building Code currently allows point access housing to be built up to five stories or six if the first floor is non-residential with the following limitations: the building does not contain a boarding house, there are only four dwelling units per floor, minimum 1-hour fire rated construction is used, the building is equipped with an automatic sprinkler

The Seattle Building Code currently allows point access housing to be built up to five stories or six if the first floor is non-residential

system, the egress core is either pressurized or naturally ventilated, a corridor must separate the unit door from the stairwell door if the stair is internal, travel distance from the unit door to the stairway cannot be more than twenty feet, elevators are pressurized or naturally ventilated, and the maximum travel distance is limited to 125 feet. Point access buildings are also limited to two single-exit conditions per property (2018 Seattle Building Code - 1006.3.3.7)

conventional multifamily buildings:

MPABs are a potential alternative to the typical “five over one” multifamily buildings that have been, and continue to be built across the country, in every city, for the last several decades. As previously described, these buildings typically use double loaded corridor layouts, which result in what are referred to as single aspect units. Single aspect apartments can limit access to light and air and reduce the effectiveness of natural ventilation.

The typical sixty five foot wide American apartment building will result in a double loaded corridor with thirty foot deep, single aspect apartments on either side (fig 6). Most jurisdictions require bedrooms to have windows, which requires approximately ten feet of exterior wall space for each bedroom, plus another twelve feet of exterior

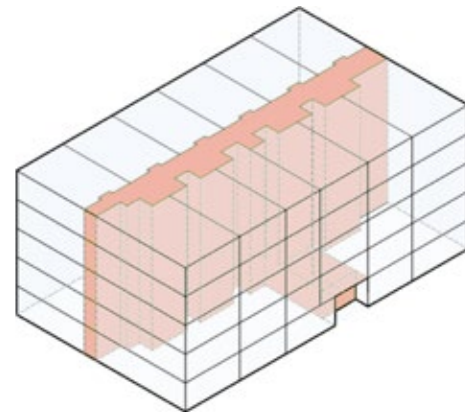


Figure 6: Isometric diagram of a conventional, double loaded apartment building (Michael Eliason 2023). Common circulation highlighted in pink.

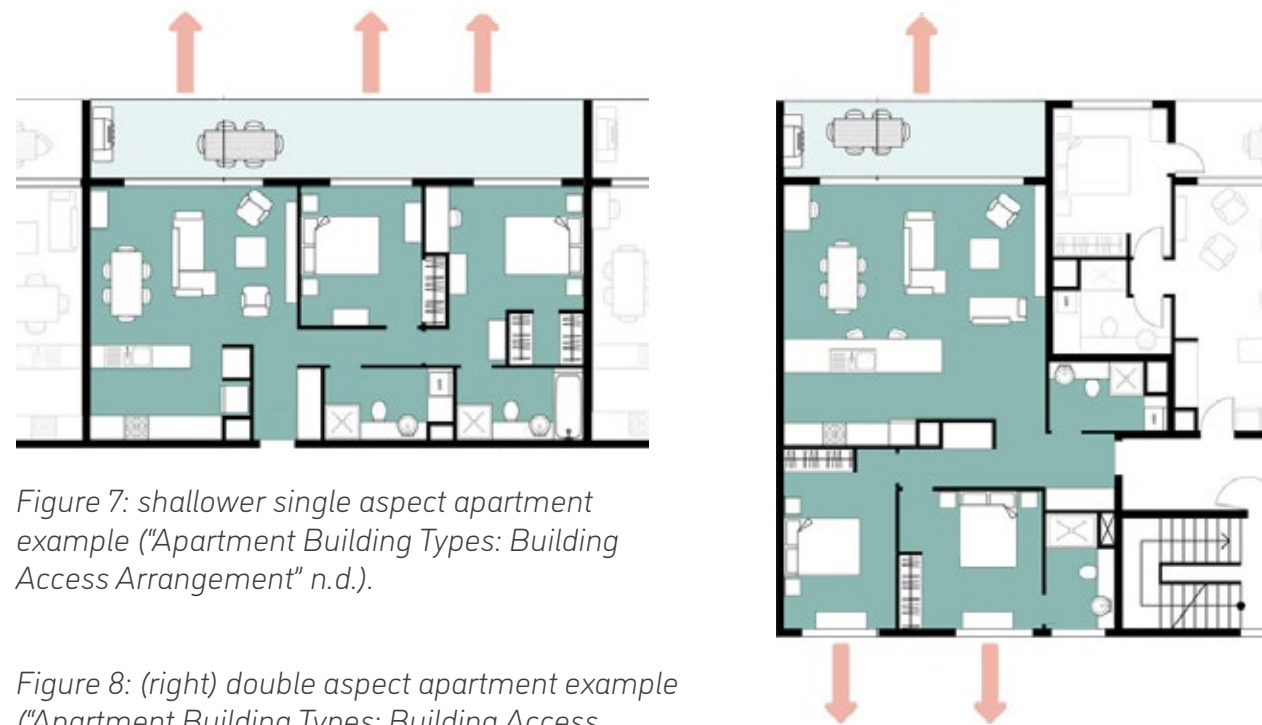


Figure 7: shallower single aspect apartment example (“Apartment Building Types: Building Access Arrangement” n.d.).

Figure 8: (right) double aspect apartment example (“Apartment Building Types: Building Access Arrangement” n.d.).

wall for living space. In a thirty foot deep apartment with multiple bedrooms, this results in an overabundance of interior floor space without access to a window. The result is usually much larger apartments with an excess of bathrooms and closets. This inefficiency leads to these multi-bedroom apartments being more expensive than their smaller, more efficient counterparts (Weisenthal and Alloway, 2023). Alternatively, as is becoming increasingly common in Seattle, loopholes in the building code can be exploited to effectively create windowless bedrooms (fig 9).

A single aspect apartment with multiple bedrooms in a narrower building will still tend to be relatively inefficient as the long, narrow aspect will require more space for hallways. In contrast, corner aspect apartments allow windows on two or even three sides, creating more space for bedrooms without the use of long hallways. These highly desirable apartments are more abundant in tower block apartments, which tend to have more efficient circulation and apartments with better views (Marriage 2022). Tower block apartments are a form of point access block, albeit usually a high-rise variety. Their multi aspect units, circulation plans and associated advantages carry over into MPABs.



Figure 9: A typical “one bedroom” apartment layout from new construction in Seattle showing the windowless bedroom and narrow galley kitchen (Hemlock, n.d.). This was found as the first result at Apartments.com in 2024.



Figure 10: A two bedroom apartment in Seattle (“The Accolade - Apartments in Seattle, WA,” n.d.). The bedrooms and living space are long and narrow in order for all three to access windows.

fire safety:

All the advantages associated with MPABs hinge on the one thing that makes them illegal in most U.S. jurisdictions: one egress core. The ideas of fire egress and fire resistance came about in the second half of the 19th century in the UK. Buildings had been getting taller but were still built of highly flammable materials. Several large building fires around this time, coupled with a more scientific mindset, lead to the creation of building codes in Britain (Law and Bisby 2020).

The first National Building Code for the US was published in 1905 after the Great Fire of Boston in 1872. From this point on, building regulations in the United States have been primarily concerned with fire safety and egress systems. These concerns have dictated the types of materials used, the methods used to build, and the height and layout of our buildings, especially apartments. Initially, egress stair requirements regulated the width of stairways, the number of people that could be housed on each floor served by the stair, and the rise and run of the stairs themselves. The idea of having two egress stairs, spaced apart from each other, may have first appeared as an idea in a 1914 report by the Committee of Safety to Life, but it did not become a code

requirement until the 1927 National Fire Protection Association Building Exit Code (NFPA 101-T), which was a model code widely adopted throughout the US until the 1980's.

a single-stair can sufficiently serve the purposes of emergency egress ... provided it is wide enough, and the occupants of a floor have clear and easy access to it.

Related codes and more recent studies have been more concerned with the width of the stairs and related flow rate of people down those stairs. In his review of international codes, Bukowski notes that "while all the codes require a minimum of two egress stairs from every floor, many of the codes address specific conditions in which a single-stairway is permitted, and some are quite liberal in

this regard." (Richard W. Bukowski 2009). Based on Bukowski's work, it would seem that a single-stair can sufficiently serve the purposes of emergency egress for a limited number of housing units, provided it is wide enough, and the occupants of a floor have clear and easy access to it.

Fire Lieutenant Danny Hopkins presents findings that would seem to agree with this in a 2017 paper looking at fire safety in UK apartment buildings. On average, UK apartments have a single-stair, with 7.4 units per floor. Nearly three times as many two-bedroom apartments are built in the UK as are one-bedroom apartments, an inverse of trends observed in the US (Hopkin 2017). While it does not necessarily indicate a direct causal relationship, it is interesting to note that the U.S. has historically had one of the highest fire death rates of industrialized countries, and in 2007 the US fire death rate per million people was 12.4, while the UK death rate was only 7.6. While both countries death rates have improved over time, a similar relationship was true in 1979 ("Fire Death Rate Trends: An International Perspective" 2011). Seattle's building

code regarding egress for MPABs has set various precautions including fewer units on each floor. These requirements are in line with recent egress studies and fire safety technology improvements.

construction costs and economic considerations:

Seattle's building code allows for the permitting of MPABs, but there may be other constraints on their construction such as land use or economics. The literature would seem to indicate that MPABs are more economically viable than smaller middle housing types due to the increase in rentable space, and potentially less expensive to build than larger apartment types due to the use of inexpensive materials and methods. MPABs may face barriers to financing since they are less common, smaller scale developments that investors may not be interested or confident in. In general though, not much research has been done on this specific scale of housing, and the existing literature on residential construction economics presents mixed results.

One analysis of construction costs of real office and multifamily projects from 1967 to 2004 found that larger projects tended to cost slightly less per square foot, and that the number of stories had a positive effect on cost. The type of structural system used in the project was also found to add to cost, with steel and concrete being more expensive than wood. This may indicate that building taller can benefit cost, but only to the point where a more robust structural system is required. The study also found that, "a larger number of smaller units in the same space cost more [to build]" (Wheaton and Simonton 2007).

John Ellis produced one of the few studies that may be directly relevant to middle housing economics. He has created a matrix of different densities of housing with associated construction cost ratios for each. A number of assumptions were used to create comparability across the categories including unit size, parking ratios, and building typologies. Through consultations with contractors, construction cost ratios were produced which indicate mid-density housing, while more expensive to build than single-family homes or duplexes, is less expensive than higher densities. The matrix does not take into account differences in land cost, construction labor costs, or potential returns on investment from each of the typologies (John G Ellis 2004). According to Harrison Architects, middle housing buildings including rowhouses, townhouses, and small apartments will cost \$275 or \$325 per square foot, however there is wide variation in cost within the typology ("Harrison Architects Construction Cost" n.d.), and construction costs have increased dramatically in the last several years.

Hongwei Dong has evaluated the role of density, and related factors in determining multifamily home prices in the Portland metro area. He defines mid-density housing as attached single-family homes, multiplexes (up to four), low-rise condos, Townhouses, and ADUs. "Commercial apartments" were not included in the definition due to data limitations, which makes the study less relevant for this project. Only sale data was used to assess cost, not rental data, which may be helpful in

understanding economic incentives (or lack of) to building middle housing. Dong found that mid-density housing types sell at lower prices than other types in dollars/unit and dollars/sq ft. Mid-density housing was found to be cheaper than single-family homes and high-density housing because of their “smaller [unit] sizes and lower construction costs.” Unit size was found to have a greater impact on price than unit density. Multiplexes were found to be the cheapest when measured at price per unit (Hongwei Dong 2020).

While multiplexes and small apartments may be less expensive in terms of construction costs, they may be less appealing for developers due to their lower return on investment or the difficulty in financing the necessary loans to build them. More research is needed to progress the conversation around middle housing and small apartment economics since the existing literature has not produced clear consensus.

summary:

Seattle is in need of more housing, of all sorts. The existing housing stock in Seattle is not accessible or suitable for many families. Our current growth strategy has produced the large, double loaded podium buildings that we have become so familiar with. These buildings concentrate growth in small areas through the use of small, single aspect apartments that encourage solitary living and higher energy consumption. In order to equitably spread growth across the city and add a wider variety of housing types, smaller, middle housing buildings will be needed. MPABs may be a suitable apartment type for this kind of growth. They offer better living units, not just for families, but for anyone looking for a more community-oriented, environmentally friendly way of living.

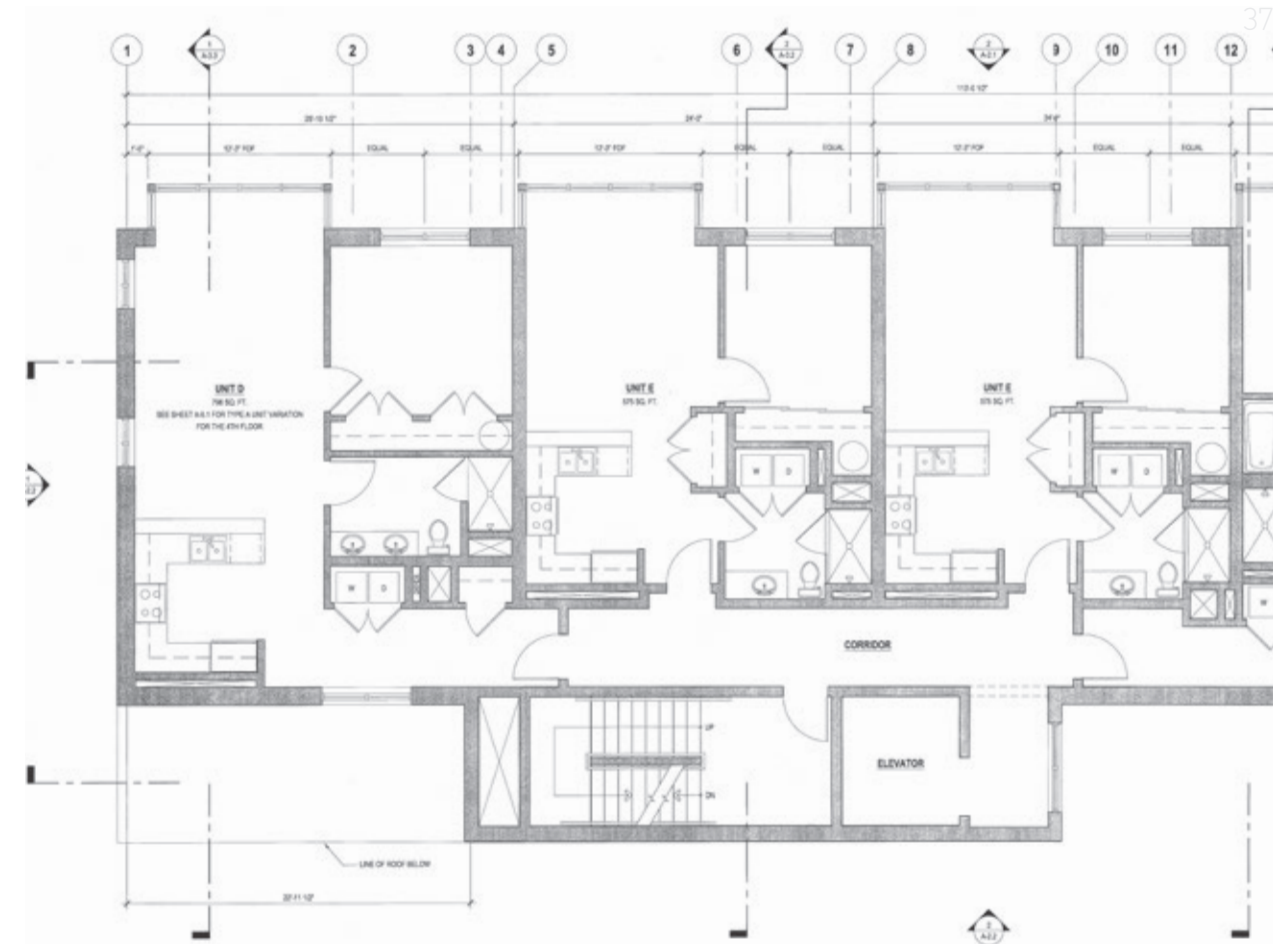
The fire codes that make MPABs illegal in most jurisdictions besides Seattle are outdated. Proper precautions and egress design render the single-stair adequate for fire safety. The single-stair design makes MPABs a more environmentally friendly building type due to their higher urban density potential, and their ability to be passively ventilated. Adjusting building codes to allow a wider variety of construction methods and building types could loosen constraints on multifamily housing production.

Further, MPABs may be faster and less expensive to build than larger podium buildings due to inexpensive materials and methods. Their added height and units, along with more efficient floor plans may make them more economically appealing to developers than smaller middle housing types. More research is needed to understand the relationship between size, unit count, and economic feasibility. The architecture thesis following this paper will attempt to understand some of these forces better, but ultimately this research should be done by real estate experts.

MPABs align well with the city's recent urban planning and housing policy goals. They could provide an effective infill strategy that is dense enough to provide more housing, and their economic viability may make them more buildable than multiplexes. They are also an excellent strategy for attracting and retaining families,

something Seattle has repeatedly expressed a need for, but more research is needed to understand economic barriers to MPABs construction in Seattle. If MPABs can succeed in meeting some of the city's housing goals, other jurisdictions may be more willing to adopt them into their building codes.

While home ownership is still an attractive proposition, it has become infeasible for most of Seattle's residents. Single-family homes have become antithetical to the city's climate and affordability goals. New strategies are needed to house Seattle's diverse and expanding population. MPABs can provide delightful, family-sized apartments at higher densities, close to urban amenities, mass transit, and opportunity.



3. Survey of Existing MPABs

Seattle's single-stair buildings

The formal definition for a Midrise Point Access Building (MPAB) used for this survey was any single-stair residential building of at least four stories, with 2-4 apartments per floor. The upper height limit was limited to whatever could be designed in compliance with Seattle's building code. There was some gray area around buildings that used single-stair circulation for only some of their floors, such as 3320 Claremont Ave S. This building is four floors, but only the upper three are residential. Several of the examples found may also have only one unit per floor, but were still included in the survey results.

Of the 212 building permits indicating new construction of midrise apartments in the last ten years, approximately 38 are MPABs. This is an approximation due to flexibility in the definition, lack of floor plans for some projects, or possible omissions from the data. The data used is publicly available building permit data from Seattle's GeoData portal. These records indicate, within the last ten years, about 16,000 total building permits, 9,400 of which are for multifamily projects. Records were filtered for issue dates between 2023-2013, residential or mixed-use projects, non-demo, new units, and including single-family detached projects.

The exploration into the use of MPABs in this project was driven in part by a need for more family-sized housing units within the city. This survey of floor plans is intended to illustrate and test some of the assumptions previously mentioned about the advantages of MPABs. Family-sized (FS) units were counted as those units with two or more bedrooms, and space for family gathering. Some of the floor plans that may have qualified were obviously laid out for roommates rather than families, e.g. en suite bathrooms and walk in closets for every bedroom and minimal living space. These units were not considered to be family-sized unless they could easily be co-opted.

Other assumptions about access to light and air were tested by estimating the number of multi-aspect units in each building, which was coded as "yes"= all multi-aspect; "mostly"=at least half of units are multi-aspect; "some"=less than half are multi-aspect; and "no"=no units are multi-aspect. This test, along with the rest of the survey, are somewhat subjective due to a lack of adequate floor plans. Generalizations based on these observations should be made cautiously. The following pages give an overview of many of the MPABs that were found through this survey of building permits. For the full table, see the appendix.

Seattle's single-stair building code

Many of the design elements and limitations found within the following projects can be understood by looking at the single-stair building code, which is as follows:

2018 SBC Chapter 10, Section 1006.3.3.7:

Not more than 5 stories of Group R-2 occupancy are permitted to be served by a single exit under the following conditions:

Interpretation:

Group R-2 includes most multifamily housing. Single-stairs can serve up to 5 floors of residential units.

7.1: The building has not more than six stories above grade plane.

An additional floor of non-residential use is allowed, such as commercial or parking.

7.2: The building does not contain a boarding house.

No boarding houses.

7.3: There shall be no more than four dwelling units on any floor.

The single-stair can only serve four units per floor.

7.4: The building shall be of not less than one hour fire-resistive construction and shall also be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Residential-type sprinklers shall be used in all habitable spaces in each dwelling unit.

Fire resistance is defined in the IBC as the ability of an element to contain a fire, perform a structural function, or both. Wood framing can comply with this standard if additional materials and methods are used (Ching and Winkel 2021).

7.5: There shall be no more than two single exit stairway conditions on the same property.

Only two single-stair conditions are permitted on one lot.

7.6: An exterior stairway or interior exit stairway shall be provided. The interior exit stairway, including any related exit passageway, shall be pressurized in accordance with Section 909.20. Doors in the stairway shall swing into the interior exit stairway regardless of the occupant load served, provided that doors from the interior exit stairway to the building exterior are permitted to swing in the direction of exit travel.

Interior exit stairs must be pressurized. Creating a higher pressure zone will discourage fire from spreading into the stairway. All doors into and out of the interior stairway must swing in the direction of exit travel, i.e. if you push, it opens.

7.7: A corridor shall separate each dwelling unit entry/exit door from the door to an interior exit stairway, including any related exit passageway, on each floor. Dwelling unit doors shall not open directly into an interior exit stairway. Dwelling unit doors are permitted to open directly into an exterior stairway.

Unit doors cannot open directly into the exit stair, unless the exit stair is exterior.

7.8: There shall be no more than 20 feet (6096 mm) of travel to the exit stairway from the entry/exit door of any dwelling unit.

Unit doors cannot be more than 20 feet from the top riser of the exit stair.



Figure 11: Image of 2514 Dexter Ave N under construction in spring of 2023.

2514 Dexter Ave N (condo):

- LR3 zone
- 2020 permit issued
- 4 residential floors
- 8 units
- 8 FS units
- 1.00 unit ratio (FS to non-FS)
- yes multi-aspect
- 43' building height

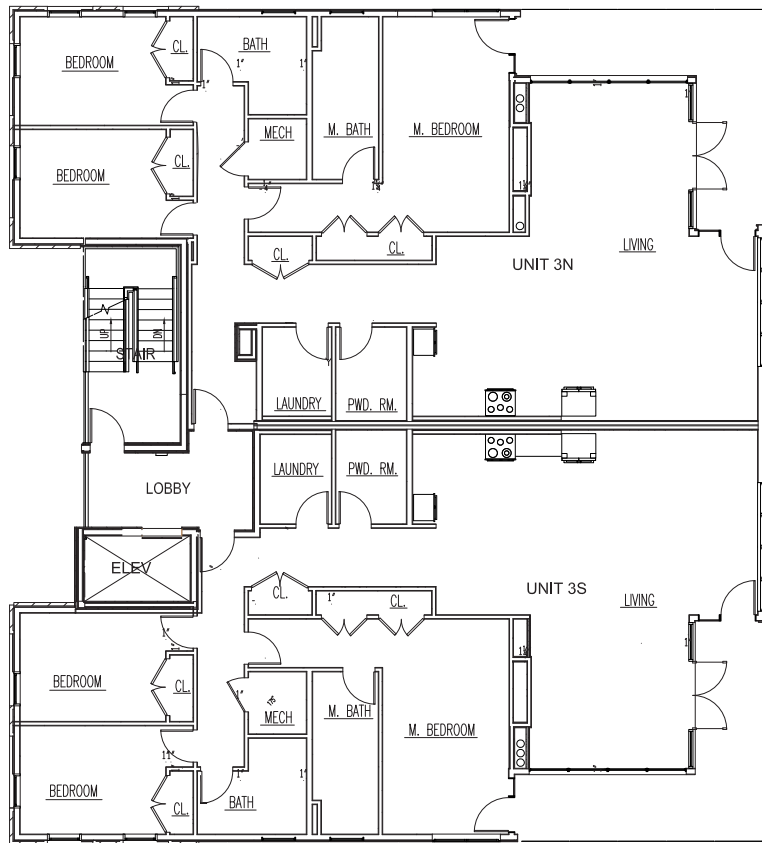


Figure 12: Typical floor plan for 2514 Dexter Ave N ("Plan Review No. 77554, Automatic Sprinkler System, 2514 Dexter Avenue North - Dexter Avenue Condominiums" 2021).

Condos:

Several of the 38 MPABs are condo projects. Both 410 11th Ave E and 1627 14th Ave are affordable homeownership condominium projects built in partnership with Habitat for Humanity. A combination of larger unit potential and alternative financial scenarios may be driving this trend. It would be interesting to look into the advantages of this building type for condo units.



1406 3rd Ave W (condo):

- LR3 zone
- 2021 permit issued
- 5 residential floors
- 13 units
- 8 FS units
- 0.62 unit ratio (FS to non-FS)
- yes multi-aspect
- 52' building height

Figure 13: Rendering of 1406 3rd Ave W in Queen Anne (Upper Queen Anne Condos, 1406 3rd Ave W Seattle, WA 98119 2021).

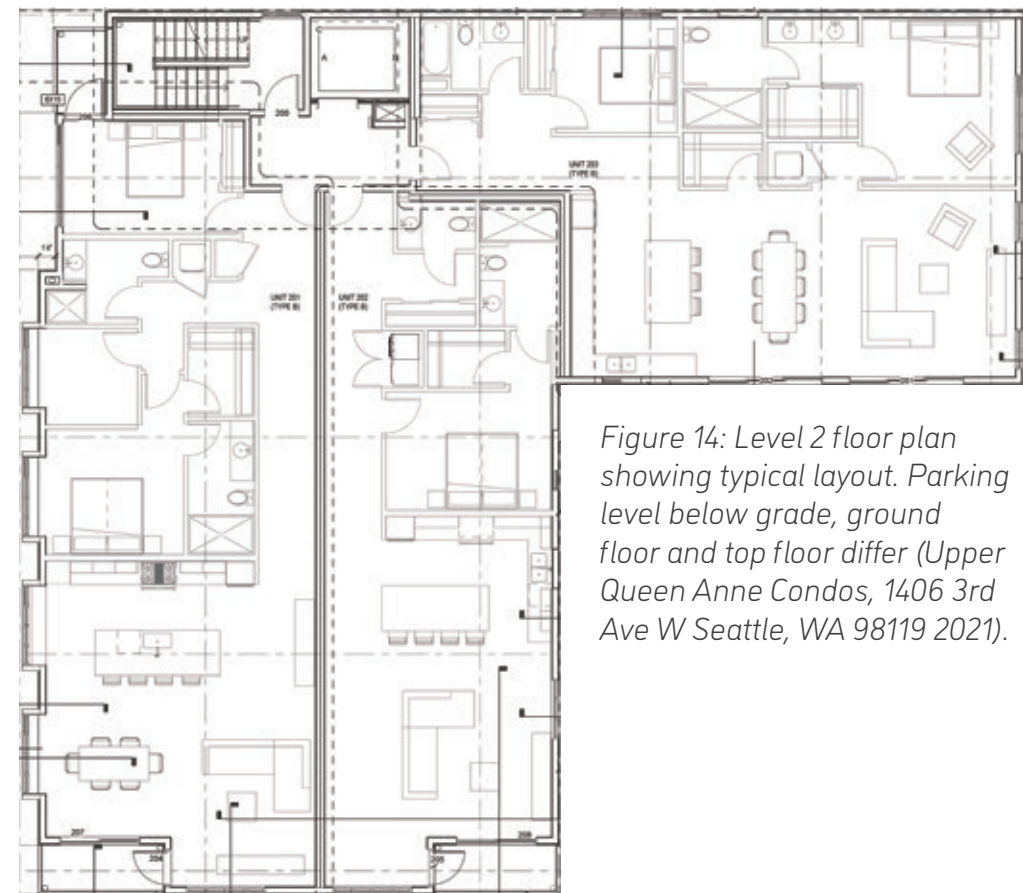


Figure 14: Level 2 floor plan showing typical layout. Parking level below grade, ground floor and top floor differ (Upper Queen Anne Condos, 1406 3rd Ave W Seattle, WA 98119 2021).



410 11th Ave E (condo):

- LR3 zone
- 2021 permit issued
- 5 residential floors
- 13 units
- 7 FS units
- 0.54 unit ratio (FS to non-FS)
- yes multi-aspect
- 53' building height

Figure 15: Images taken of 410 11th Ave E showing front elevation, entrance. Located in Capitol Hill

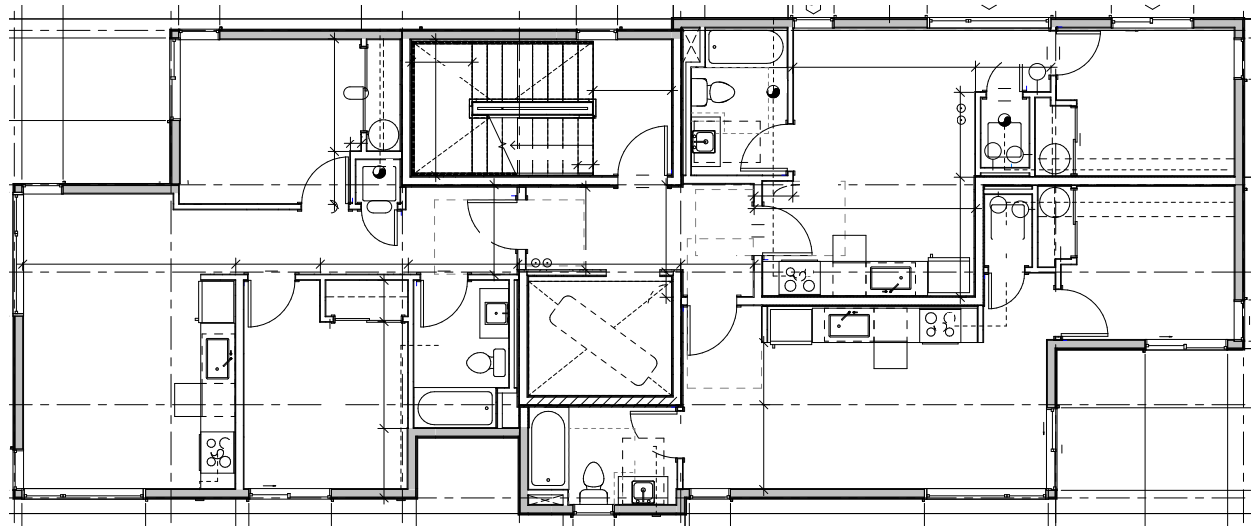


Figure 16: Simplified upper level plan from the 410 11th Ave E Habitat for Humanity project (Habitat on 11th Ave E 2021).



1627 14th Ave (condo):

- LR3 zone
- 2023 permit issued
- 5 residential floors
- 17 units
- 2 FS units
- 0.12 unit ratio (FS to non-FS)
- yes multi-aspect
- 50' building height

Figure 17: Images taken of 1627 14th Ave under construction in January, 2024. There is an existing multifamily project to the south and a single-family home to the north. Located in Capitol Hill.

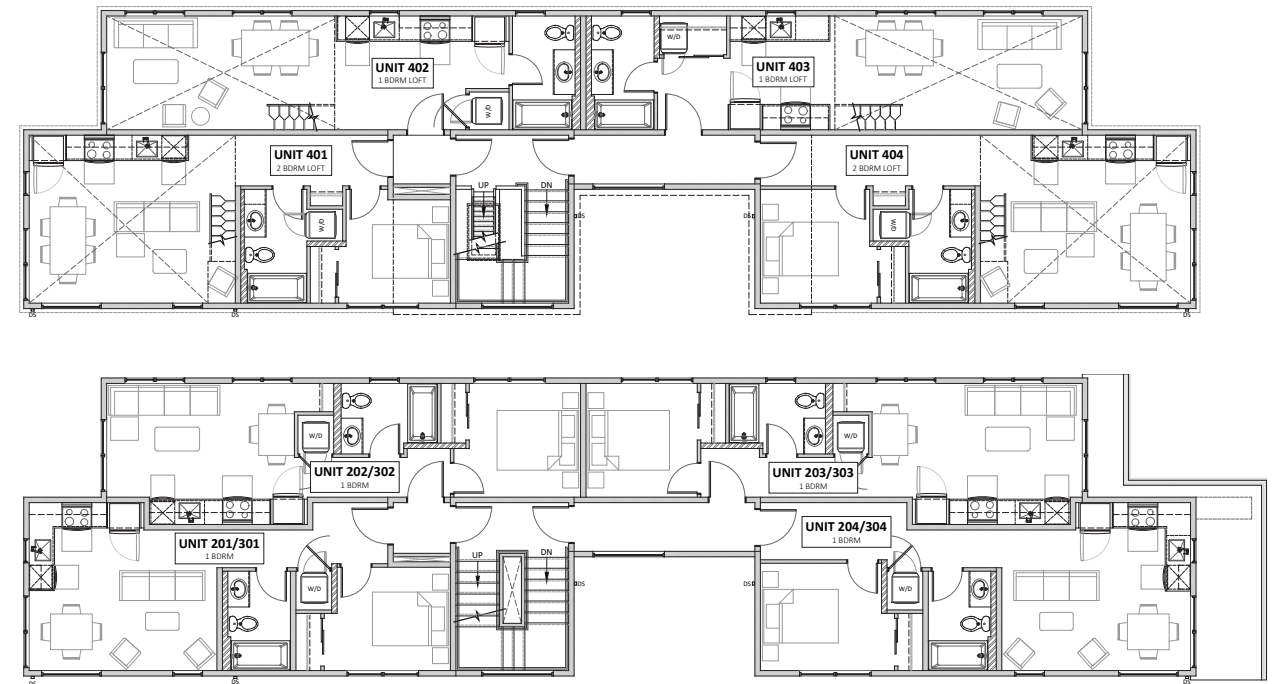
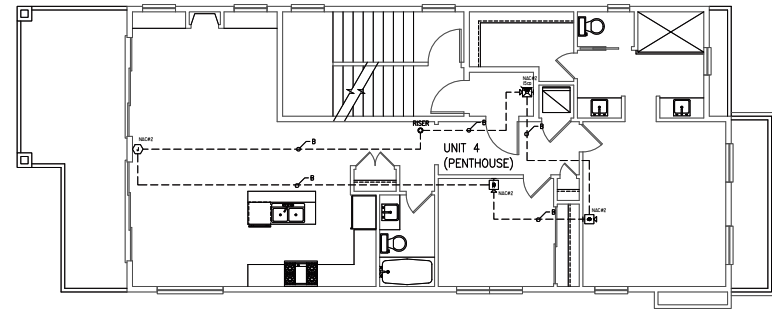
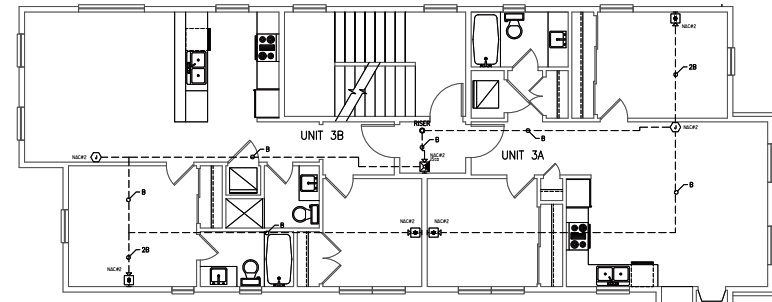


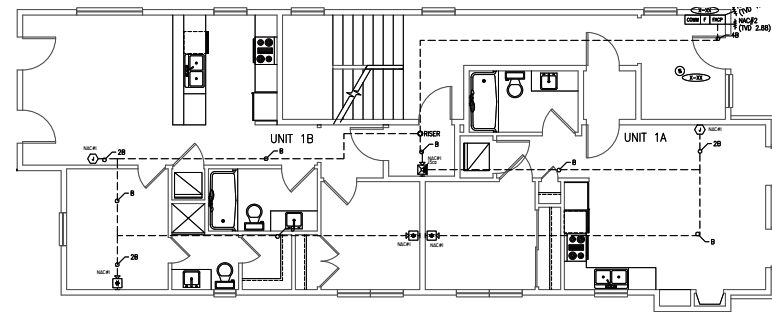
Figure 18: Second and third floor plans of 1627 14th Ave ("Early Design Guidance, Streamlined Design Review, 1627 14th Ave Seattle, WA 98122" 2023)



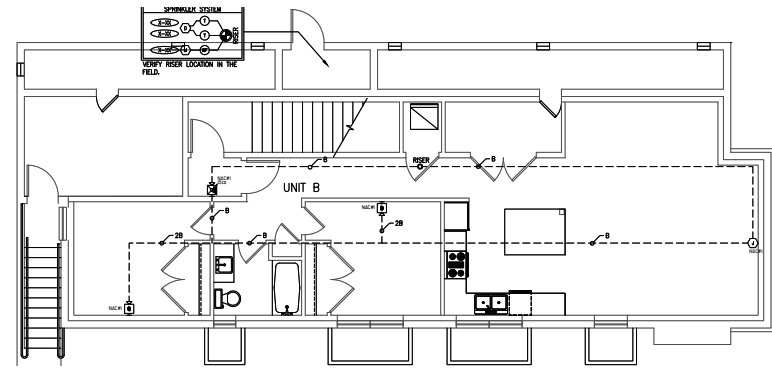
fourth floor



second and third floor



first floor



basement

Figure 19: Floor plans for 735 Broadway E. This building has no elevator (735 Broadway Condos, Fire Alarm System, 735 Broadway East, Seattle, WA 2017).

735 Broadway E (condo):

- LR3 zone
- 2016 permit issued
- 5 residential floors
- 8 units
- 6 FS units
- 0.75 unit ratio (FS to non-FS)
- yes multi-aspect
- NA building height

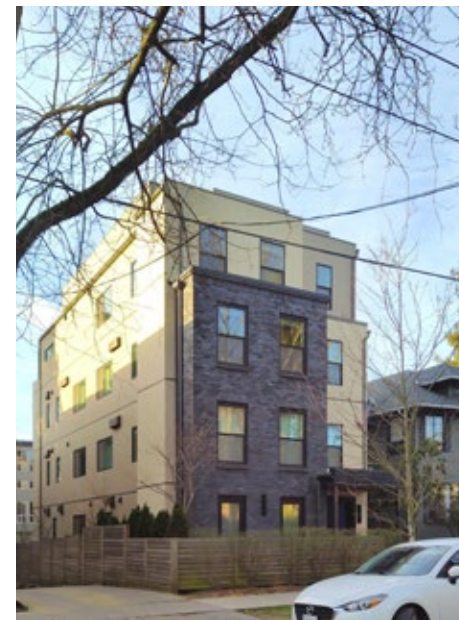


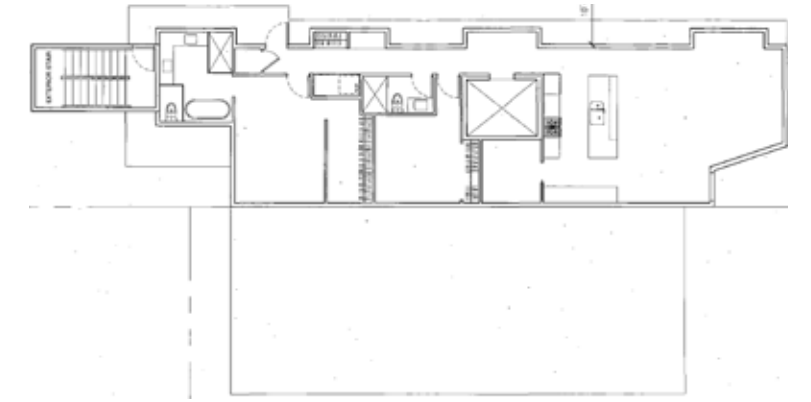
Figure 20: Image of 735 Broadway E. Facade treatment is intended to blend with context by reducing perceived building height.

Pushing height limits:

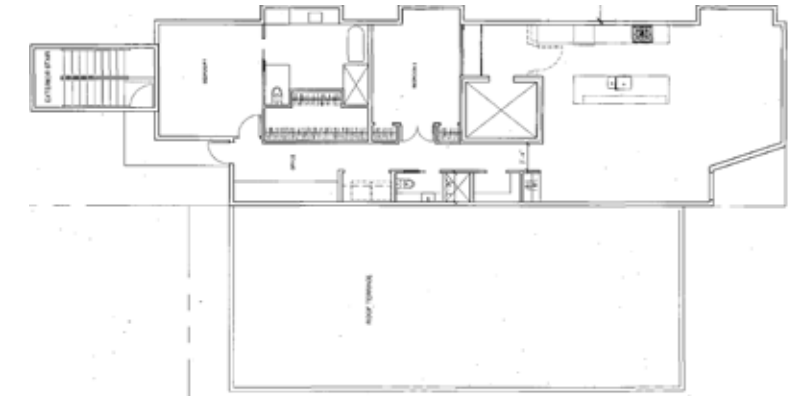
Several of the projects have found ways to stretch the building code single-stair height limit in order to utilize additional height in MR zones. Live/work units are used at the ground floor, and mezzanine levels are used to create loft units at the top floors in order to work around the code limit of five floors of residential. Some of these buildings are seventy feet or more in height. 210 West Comstock Street is unique in that the building is split between LR1 and MR zones. In order to better use the MR zone height limit, the ground floor unit is not served by the stairs, allowing an additional sixth floor.

210 W Comstock St (condo):

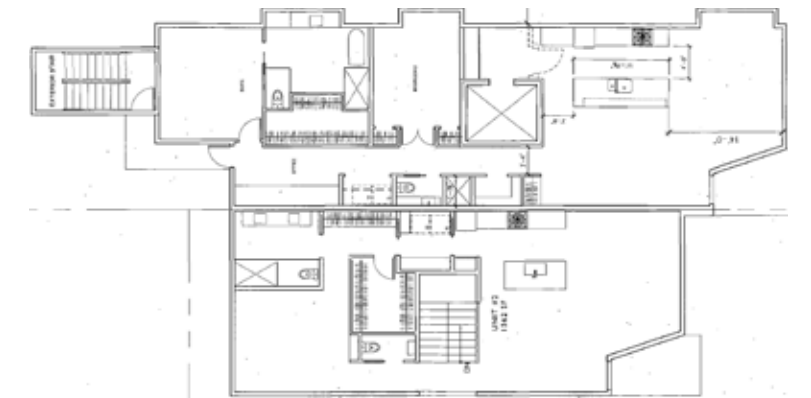
- LR1/MR zone
- 2016 permit issued
- 6 residential floors
- 8 units
- 7 FS units
- 0.88 unit ratio (FS to non-FS)
- yes multi-aspect
- NA building height



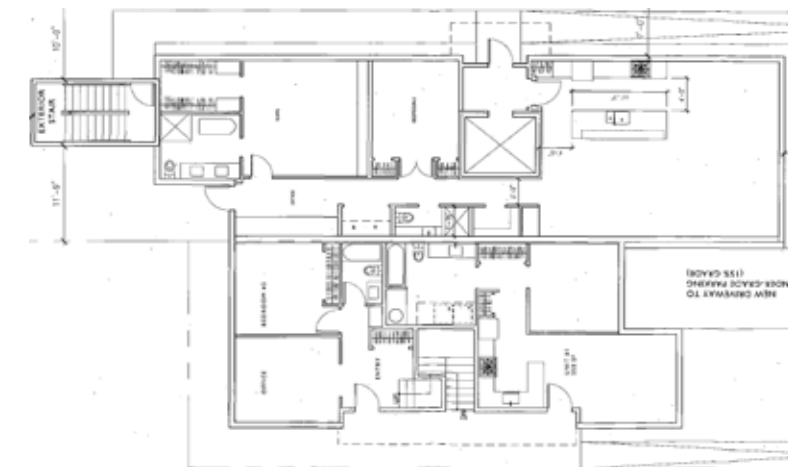
fifth and sixth floor



third and fourth floor

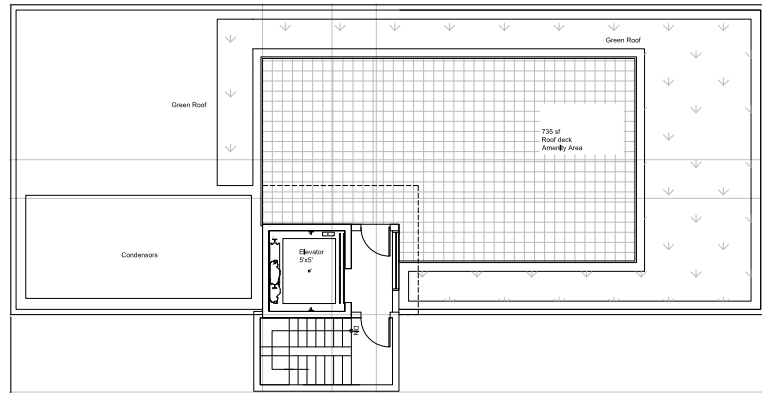


second floor

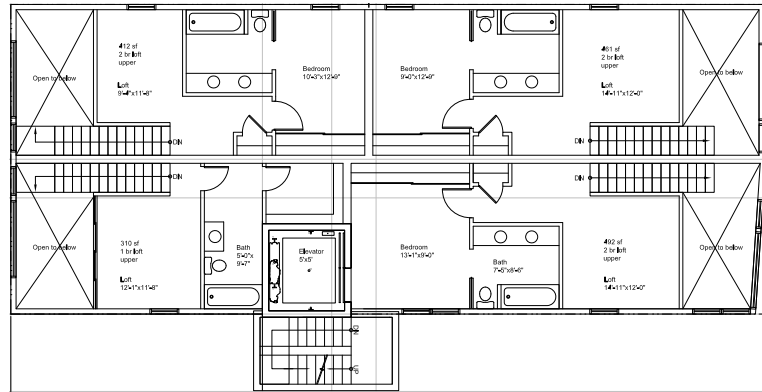


first floor

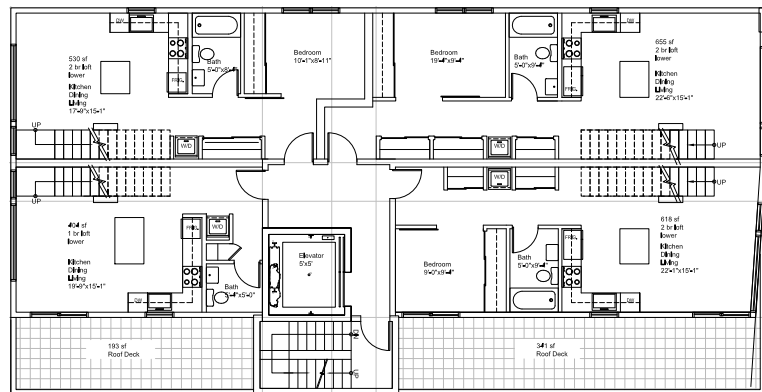
Figure 21: Floor plans for 210 W Comstock St. in Queen Anne. The property is split horizontally between LR1 and MR zones. Parking below grade ("Pre-Submittal Conference Application for 210 W Comstock St, Seattle WA 98119" 2013)



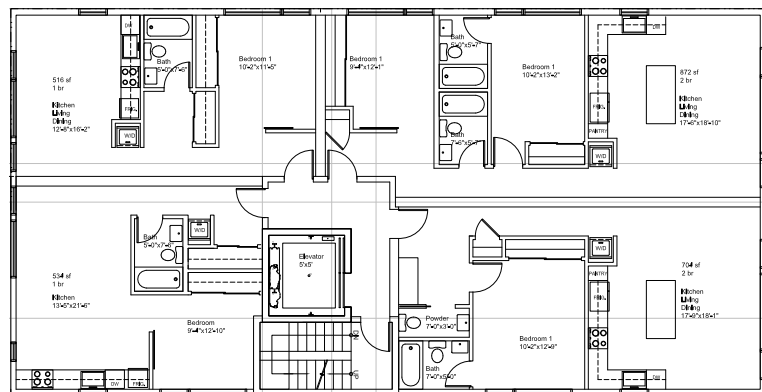
roof deck



seventh (mezzanine) floor



sixth floor



second through fifth floor

2018 NW 57th St (condo):

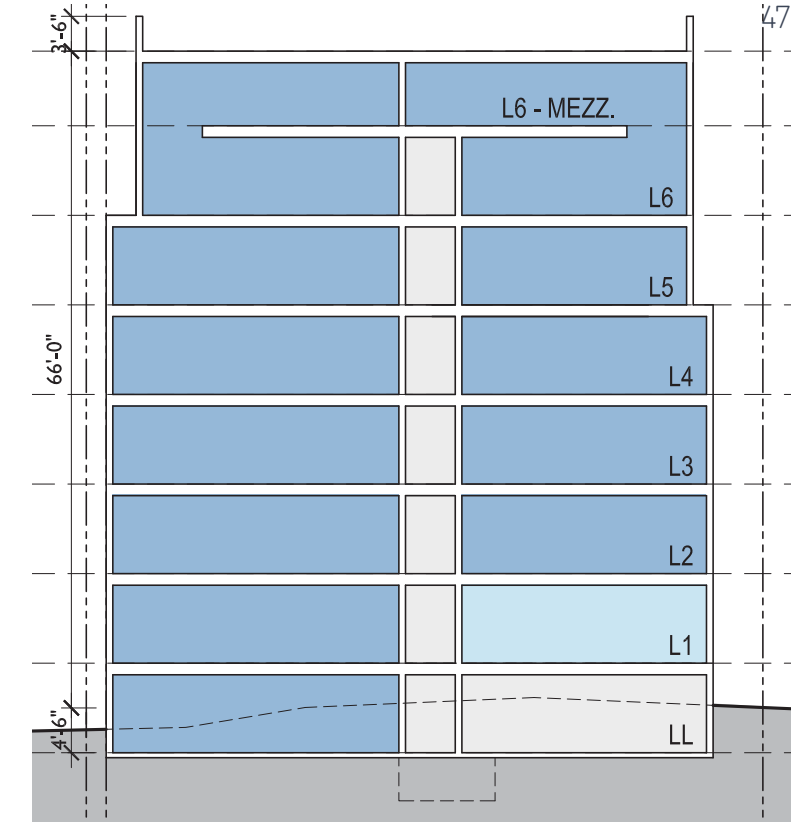
- MR-RC zone
- 2014 permit issued
- 6 residential floors
- 20 units
- 7 FS units
- 0.35 unit ratio (FS to non-FS)
- yes multi-aspect
- 70' building height

2018 NW 57th St achieves seven floors with a single-stair design through the use of a mezzanine level and loft units at the top of the building. The shared stair does not serve the mezzanine level, rather this floor is accessed via private stairs within the units. The first floor is occupied with parking and therefore does not count towards the five levels of residential occupancy that the building code limits these buildings to.

Figure 22: Floor plans for 2018 NW 57th St in Ballard (Solo Ballard Lofts, 2018 NW 57th Street 2014).



Figure 23: Image of "Capitol Core" (Lloyd 2017).



215 Boylston Ave E:

- MR zone
- 2014 permit issued
- 7 residential floors
- 17 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- NA multi-aspect
- 69' building height

215 Boylston Ave E takes a similar approach as 2018 NW 57th St, using a mezzanine level at the top of the building to take advantage of the height limit in the MR zone. The base height limit for this zone was 60' at the time the building was permitted in 2014, before being updated to MR (M) in 2019 and increasing to 80'. Height bonuses for partially bellow grade levels, along with parapet exemptions allow the 69' total height.

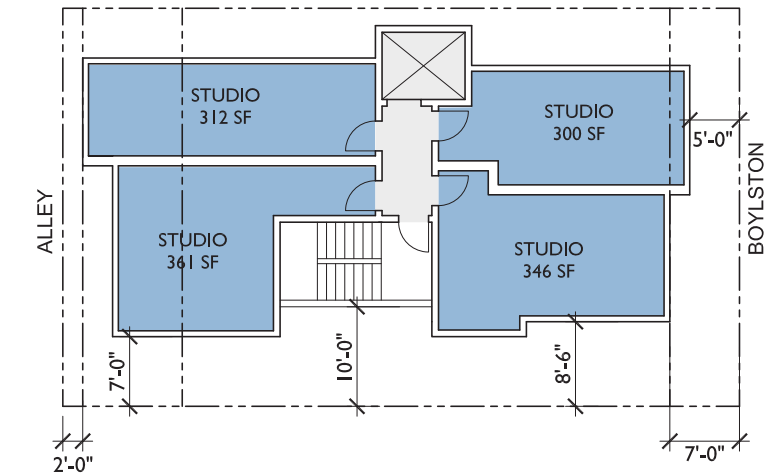


Figure 24: Section and conceptual plan of the "Capitol Core Apartments" in Capitol Hill ("Boylston Avenue E, Early Design Guidance Draft," n.d.).



Additions and Infill:

One of MPABs' greatest strengths is their ability to be used in small spaces and odd circumstances. Several of the projects that were found through this survey are either additions to existing buildings, or separate buildings added on the same lot as existing buildings. Single-stair designs can be extremely efficient and compact, making them great choices for these projects.

Figure 25: Google satellite imagery of 1901 E Fir St in the Central District.



1901 E Fir St:

- LR3 zone
- 2019 permit issued
- 5 residential floors
- 20 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- some multi-aspect
- 48' building height

Figure 26: Elevation of 1901 E Fir St showing connection to existing building (HUP, Sylvette, 1901 E Fir St 2019).

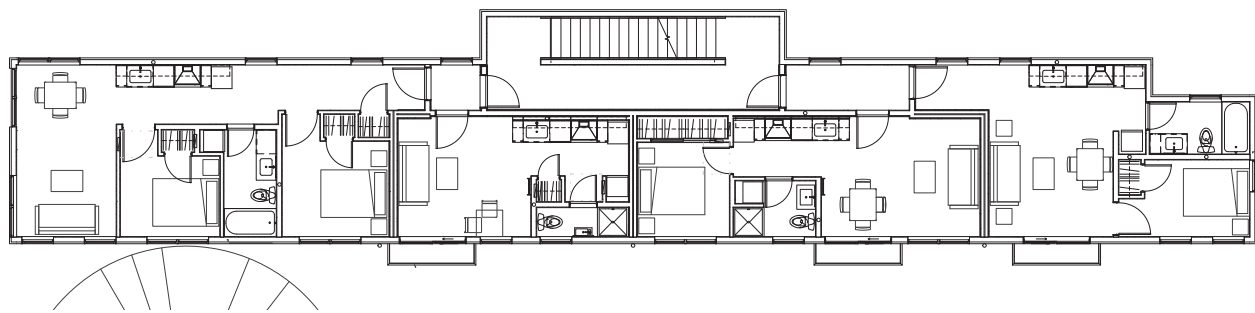


Figure 27: Typical upper level floor plan for 1901 E Fir St (HUP, Sylvette, 1901 E Fir St 2019).



1611 S Weller St:

- LR3 zone
- 2014 permit issued
- 4.5 residential floors
- 8 units
- NA FS units
- NA unit ratio (FS to non-FS)
- NA multi-aspect
- NA building height

Figure 28: Images of 1611 S Weller St.

No plans for this project were found in Seattle's permit records, but satellite imagery and other observations indicate that this project is a single-stair building. The existing building appears to be a single-family home that was converted into multiple living units.



1436 NW 60th St:

- LR3 zone
- 2017 permit issued
- 4 residential floors
- 8 units
- NA FS units
- NA unit ratio (FS to non-FS)
- NA multi-aspect
- NA building height

Similar to 1611 S Weller St, this project was built on a lot with an existing apartment building. No plans were found.

Figure 29: Photos of 1436 NW 60th St.

Figure 30: Photo of 2010 E Jansen Ct taken in spring of 2024.



2010 E Jansen Ct:

- LR3 zone
- NA permit issued
- 5 residential floors
- 10 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- mostly multi-aspect
- 45' building height

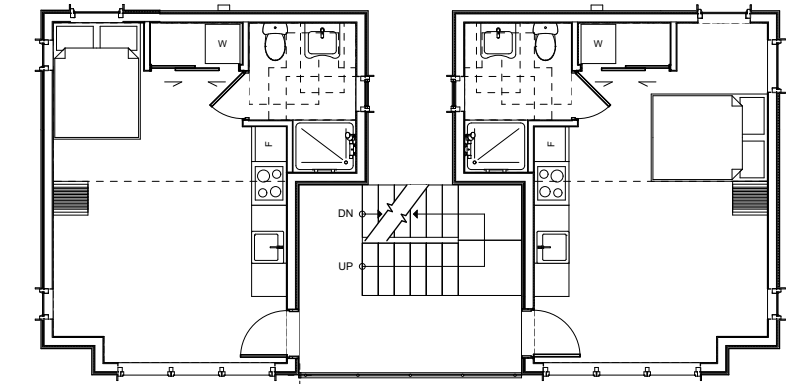


Figure 31: (above) Typical upper level floor plan (Jansen Court Apartments, SDR Packet 2017).

Figure 32: (below) Elevation showing relationship to existing triplex (Jansen Court Apartments, SDR Packet 2017).



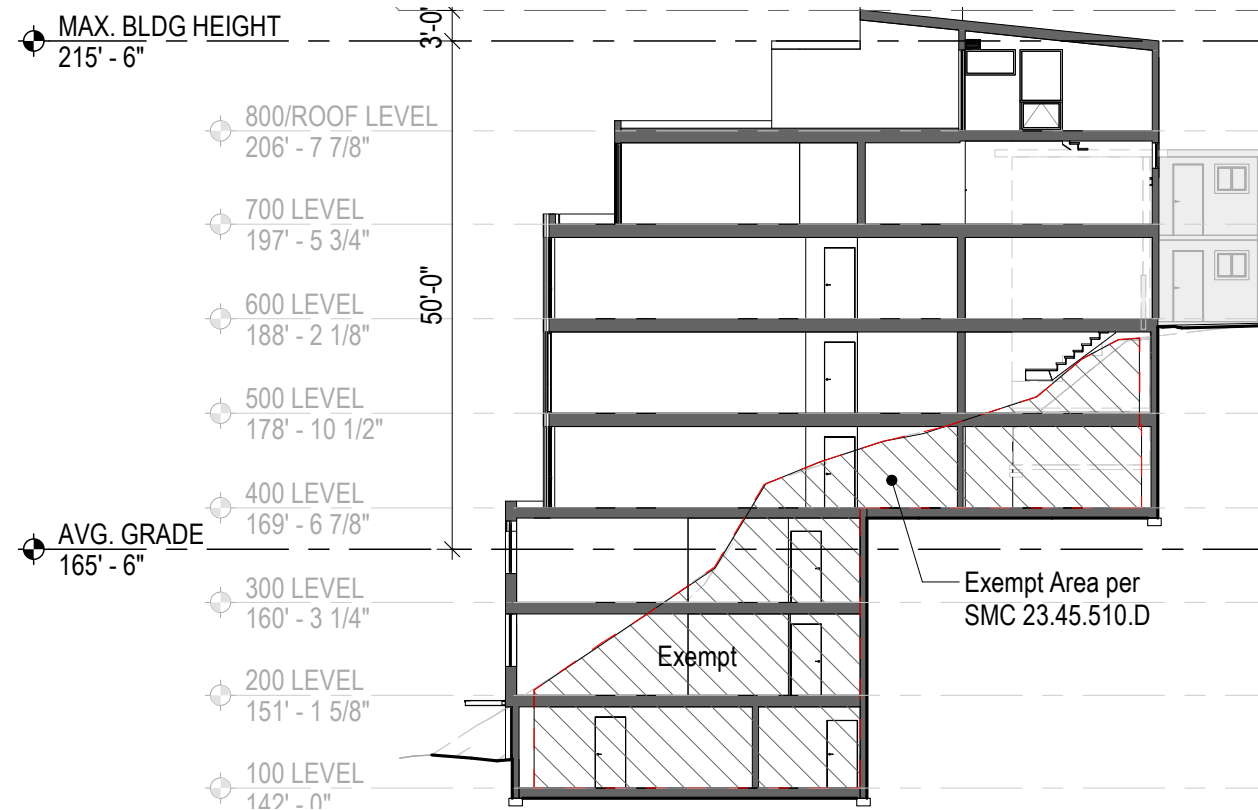


519 N Bowdoin Pl is a uniquely complex project that employs two single-stair conditions (the maximum number allowed on one property) stacked on top of each other. The lower stair serves the first through the third floor with an entrance at the first floor off of N 39th St. The second stair serves levels four through seven with an entrance at the sixth floor. The eighth floor contains the upper level of a single, two level unit with interior private stairs. The elevator serves all floors, saving on construction cost and floor space. The entire project is technically an addition to an existing apartment building accessed off of N Bowdoin Pl, but there is no interior access between the two buildings. This project uses multiple strategies to maximize rentable space on a tricky site.

Figure 33: Image of 519 N Bowdoin Pl under construction in Spring of 2024.

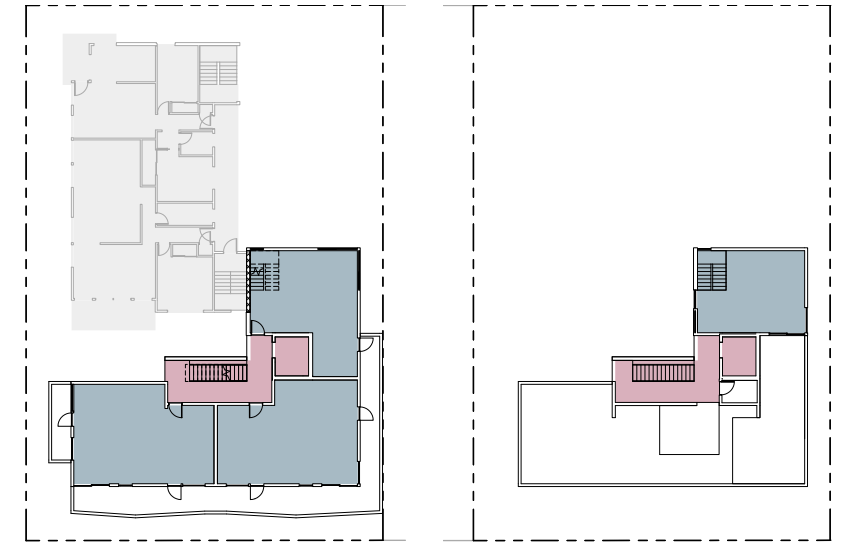
Figure 34: (opposite pg) Recolored conceptual plans

Figure 35: (below) Conceptual section showing FAR-exempt bellow grade floor area and height from average grade per LR3 height limit. (Fremont View Apartments 2020).



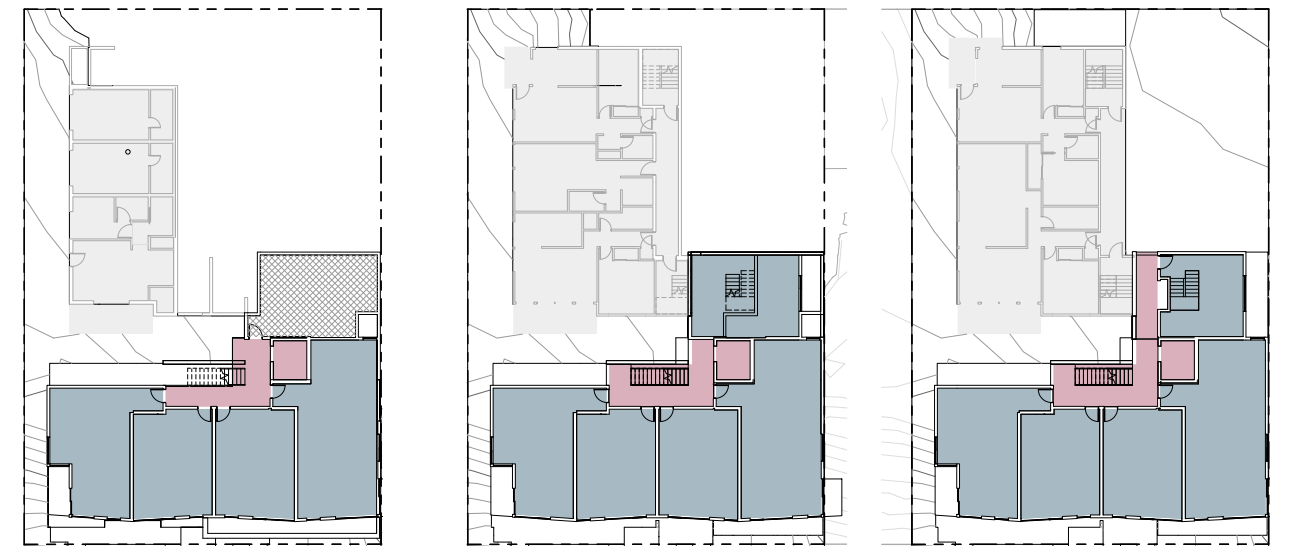
519 N Bowdoin Pl:

- LR3 zone
- 2022 permit issued
- 8 residential floors
- 29 units
- 4 FS units
- 0.14 unit ratio
- some multi-aspect
- 53' building height from average grade
- 76' building height from N 39th Street



7th floor

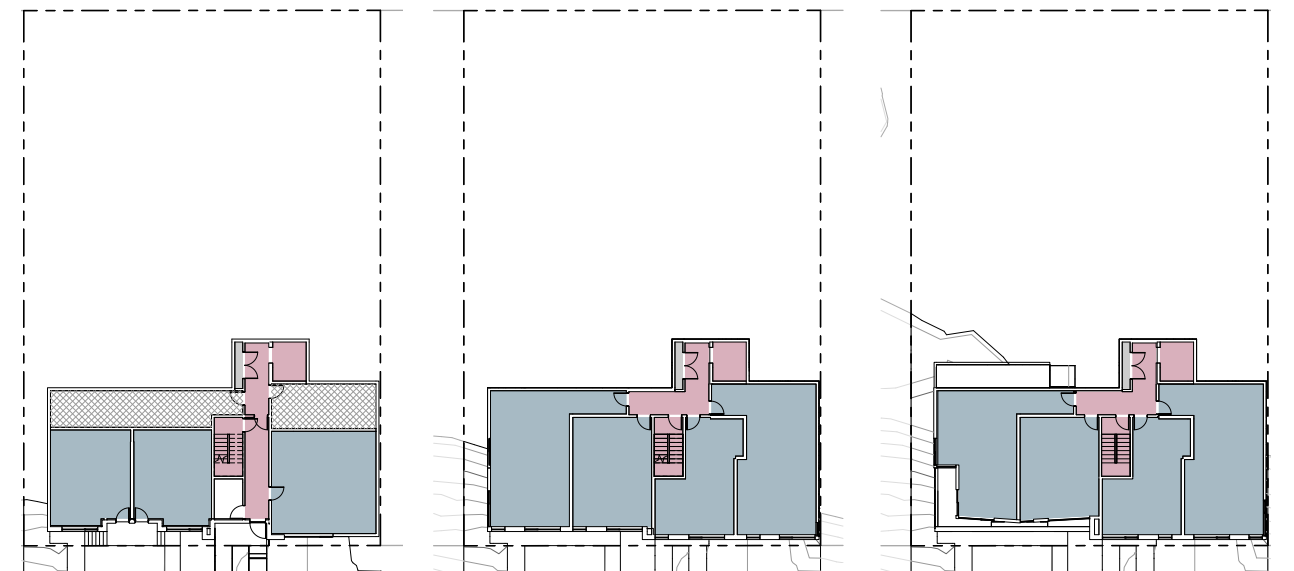
8th floor



4th floor

5th floor

6th floor (entrance)



1st floor (entrance)

2nd floor

3rd floor



Small Units & Student Housing:

Many of the buildings that were observed in this survey are filled with small units: mostly one bedrooms, studios and SEDUs. A second stair is commonly added in order to accommodate more units per floor. The following are the single-stair buildings with some of the smallest units, or units obviously designed for student living.

5521 15th Ave NE:

- LR3 zone
- 2019 permit issued
- 5 residential floors
- 20 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- mostly multi-aspect
- 44' building height

Figure 36: Images of 5521 15th Ave NE, north of the University District.

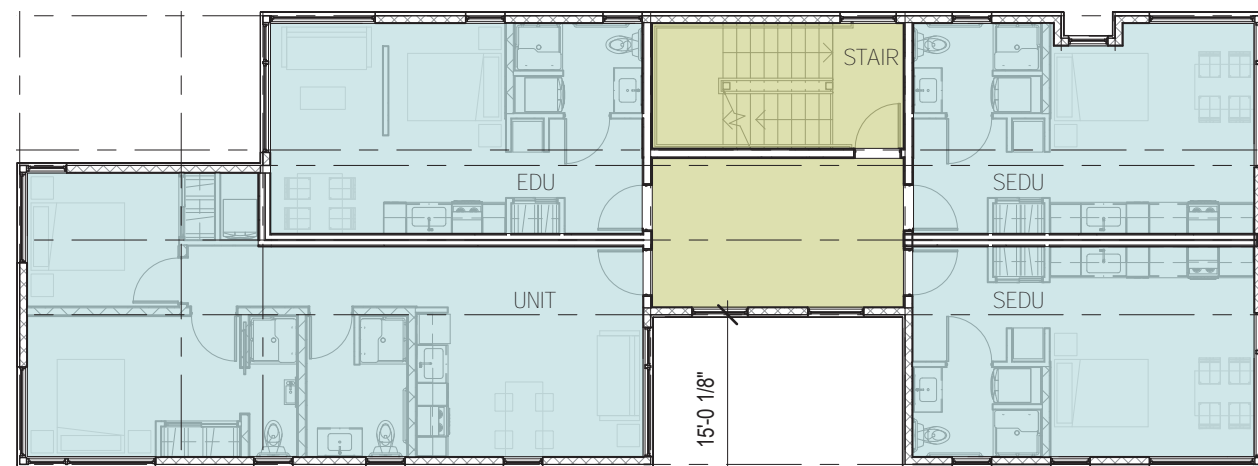


Figure 36: Upper level floor plans for 5521 15th Ave NE (5521 15th Ave NE, Streamlined Design Review, n.d.). The two bedroom units do not meet the technical spatial requirement, measuring approximately 710sf. To be family-sized, units must be at least 850sf.

The use of two single-stair conditions in the 4011 Wallingford project removes the need for a central hallway, creating more space for units on this narrow lot.



4011 Wallingford Ave N:

- NC1-40 zone
- 2023 permit issued
- 4 residential floors
- 21 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- mostly multi-aspect
- NA building height

Figure 38: Image of 4011 Wallingford Ave N under construction in spring of 2024

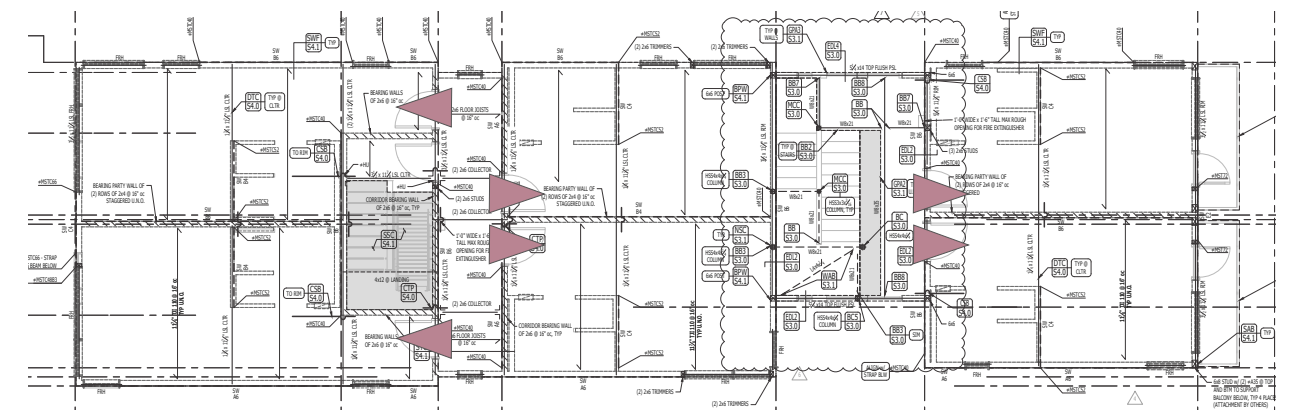


Figure 39: Upper level framing plan for 4011 Wallingford Ave N ("4011 Wallingford Ave N Structural Plans" 2023), overlaid with typical unit and access diagram.

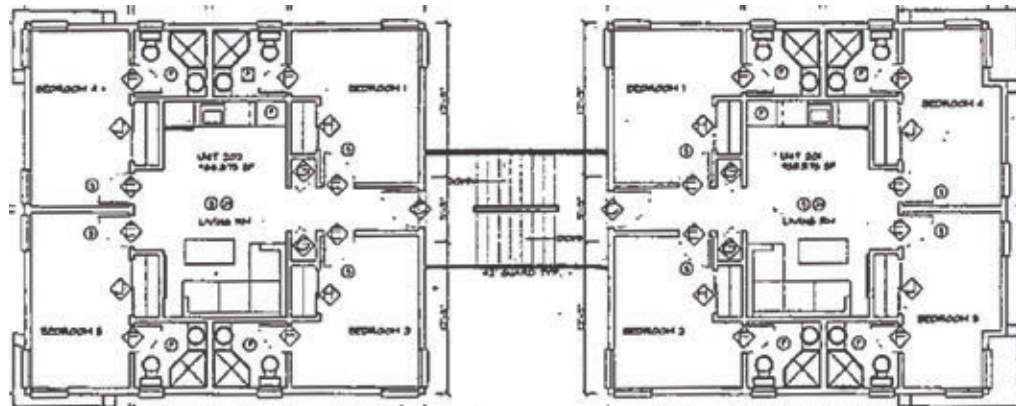


Figure 40: All three of these buildings, located in the University District, share identical floor plans favoring roommates rather than families.

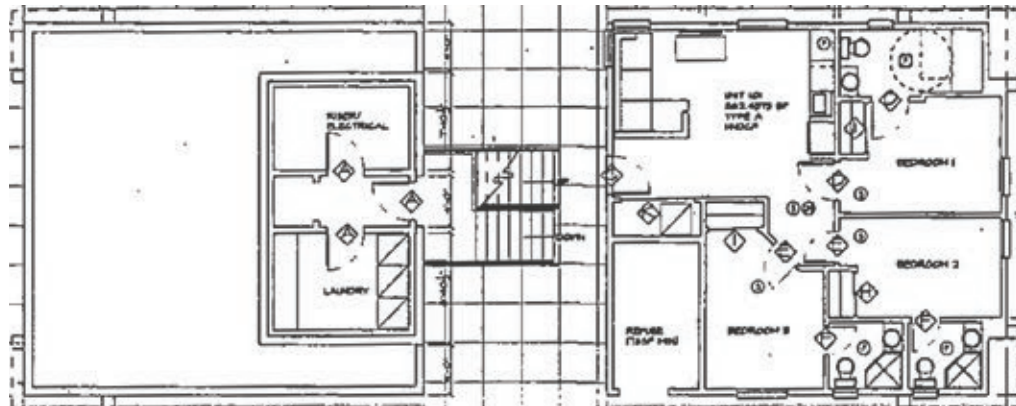
4215, 4219, 4221 9th Ave NE:

- LR3 zone
- 2013 permit issued
- 4 residential floors
- 8 units
- 1? FS units
- 0.13 unit ratio (FS to non-FS)
- yes multi-aspect
- NA building height

Figure 41: (below) floor plans for the 9th Ave NE buildings ("Pre Submittal Conference Notes, 4217 9th Ave NE" 2012). The first level may or may not contain what is already questionable as a family-sized unit. The actual buildings appear to have different first level plans.



2nd - 4th floors



1st floor



5234 15th Ave NE:

- LR3 zone
- 2015 permit issued
- 4 residential floors
- 8 units
- 1? FS units
- 0.13 unit ratio (FS to non-FS)
- yes multi-aspect
- NA building height

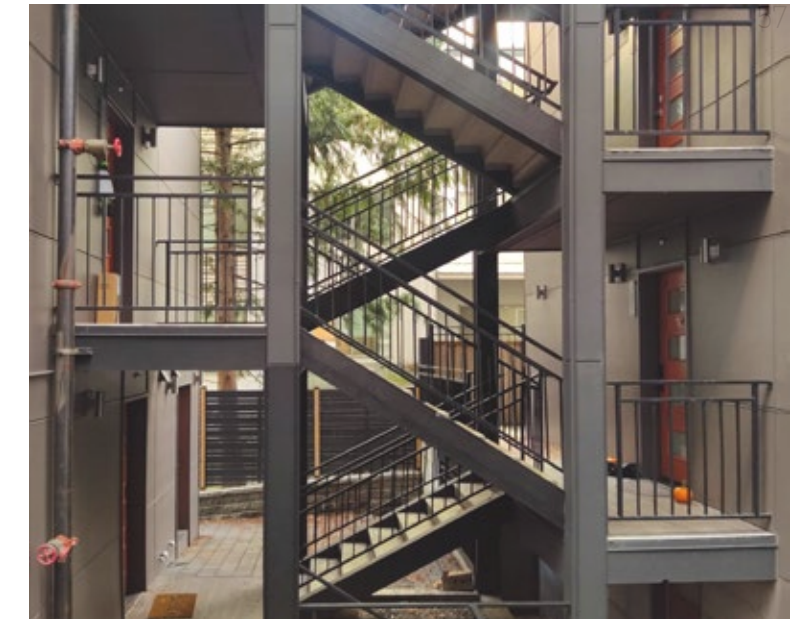
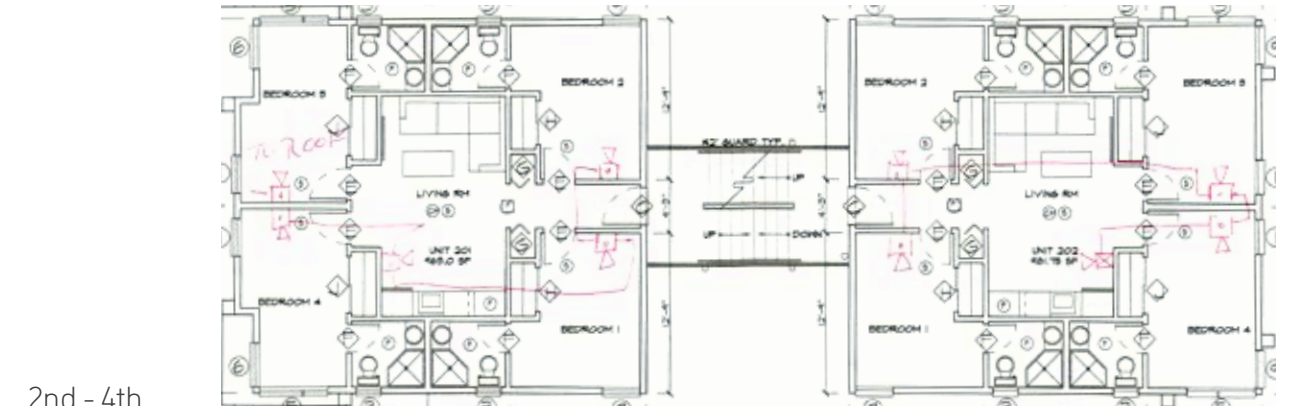
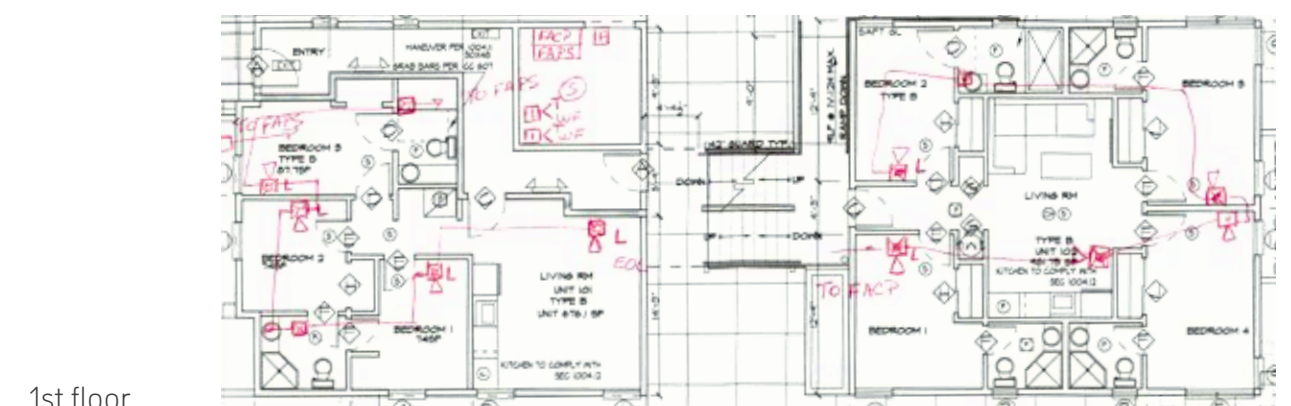


Figure 42: Images of 5234 15th Ave NE in the University District. Right: shared exterior stair works with alternating floor levels.

Figure 43: (below) floor plans for 5234 15th Ave NE ("Plan Review No. 63920, Fire Alarm System, 5234 15th Av NE" 2018). Note that this is the same plan, from the same developer, as 4215, 4219, and 4221 9th Ave NE.



2nd - 4th



1st floor



1823 13th Ave:

- LR3 zone
- 2020 permit issued
- 5 residential floors
- 20 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- mostly multi-aspect
- 59' building height



Figure 45: Rendered model view of 1823 13th Ave, taken from B9 Architects' website ("Seattle Apartment Design and Architecture: 13th Avenue Apartments," n.d.).

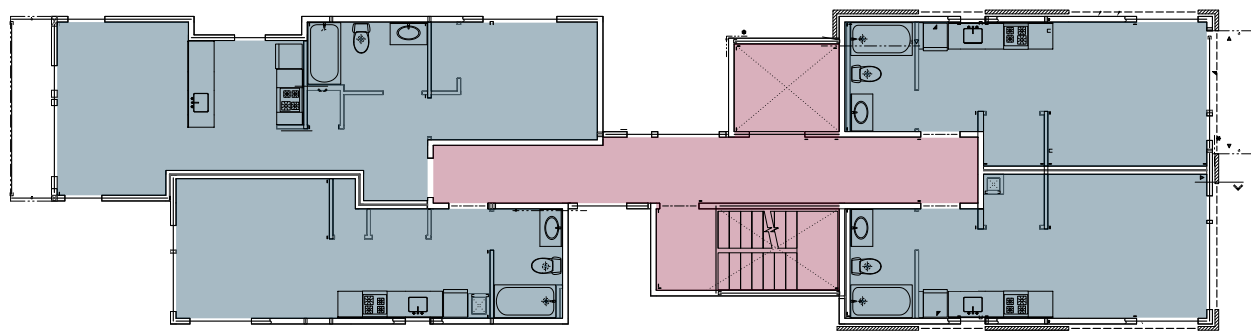


Figure 46: Adapted framing plan for a typical upper level floor in 1823 13th Ave (1823 13th Avenue 2020). Colored unit diagram overlaid.



3623 Fremont Ave N:

- LR3 zone
- 2016 permit issued
- 5 residential floors
- 11 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- yes multi-aspect
- 44' building height

Figure 47: Images of the Fremont Flats. When the photos were taken in spring of 2024, there was a large construction sight on the adjacent lot.

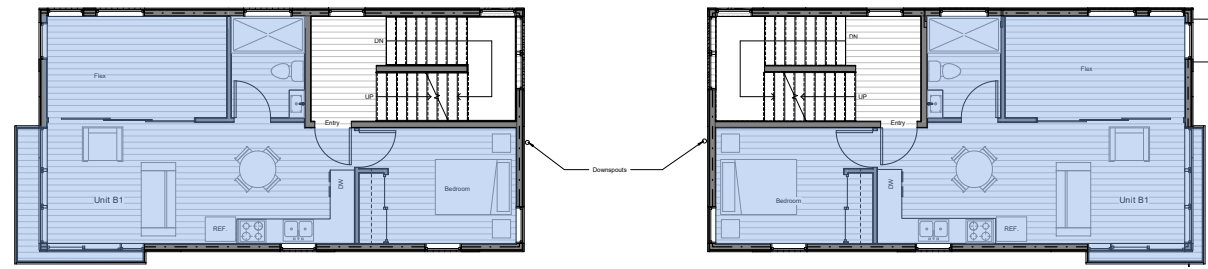


Figure 48: Typical upper level floor plan (Fremont Urban Apartments, Design Recommendation 2017).

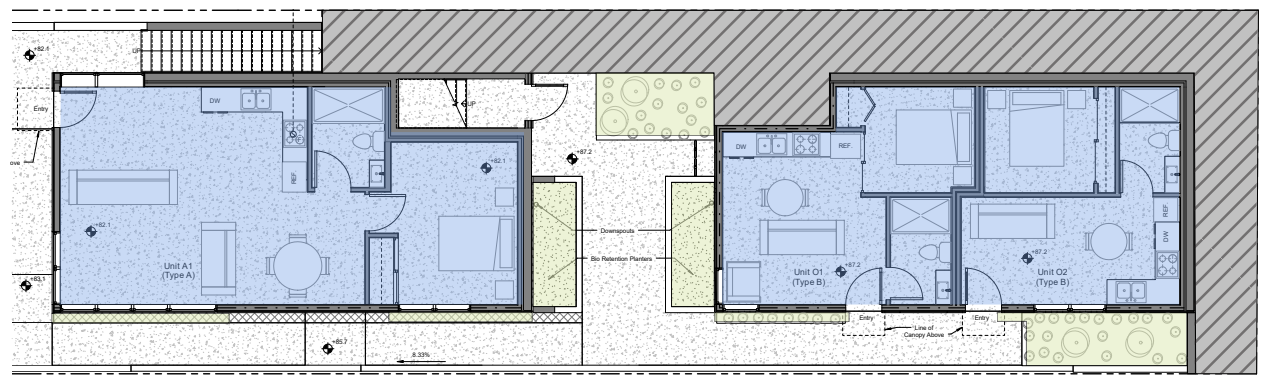


Figure 49: Basement floor plan (Fremont Urban Apartments, Design Recommendation 2017).

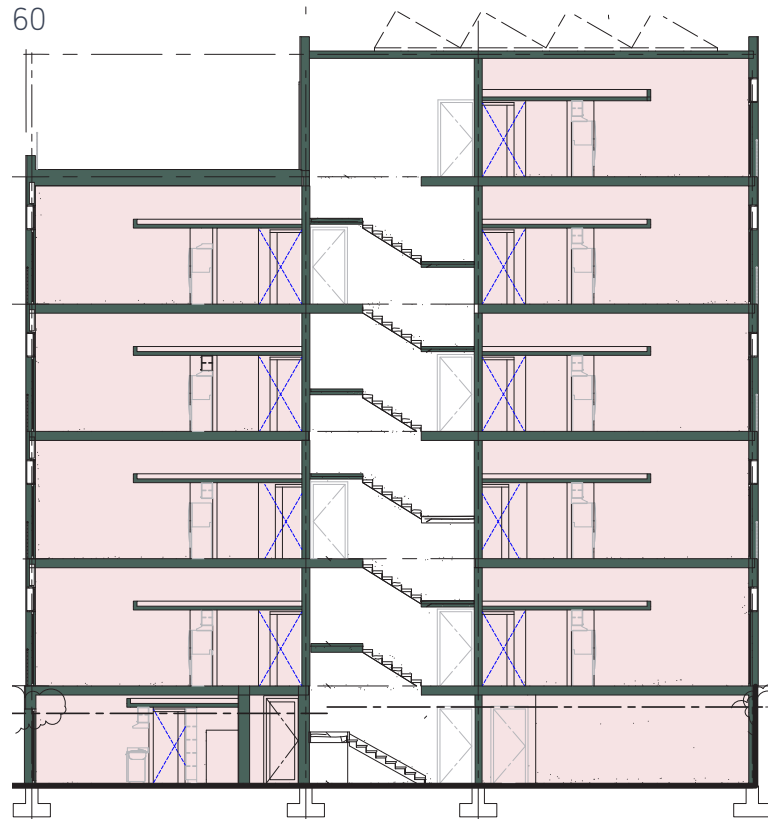


Figure 50: Edited section showing loft spaces in each unit (The Arbol Lofts, 611 E Howell St Seattle, WA 98122 2014).

Figure 51: (upper left) Photo of 611 E Howell St elevation.



611 E Howell St:

- MR zone
- 2015 permit issued
- 5.5 residential floors
- 20 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- mostly multi-aspect
- 64' building height

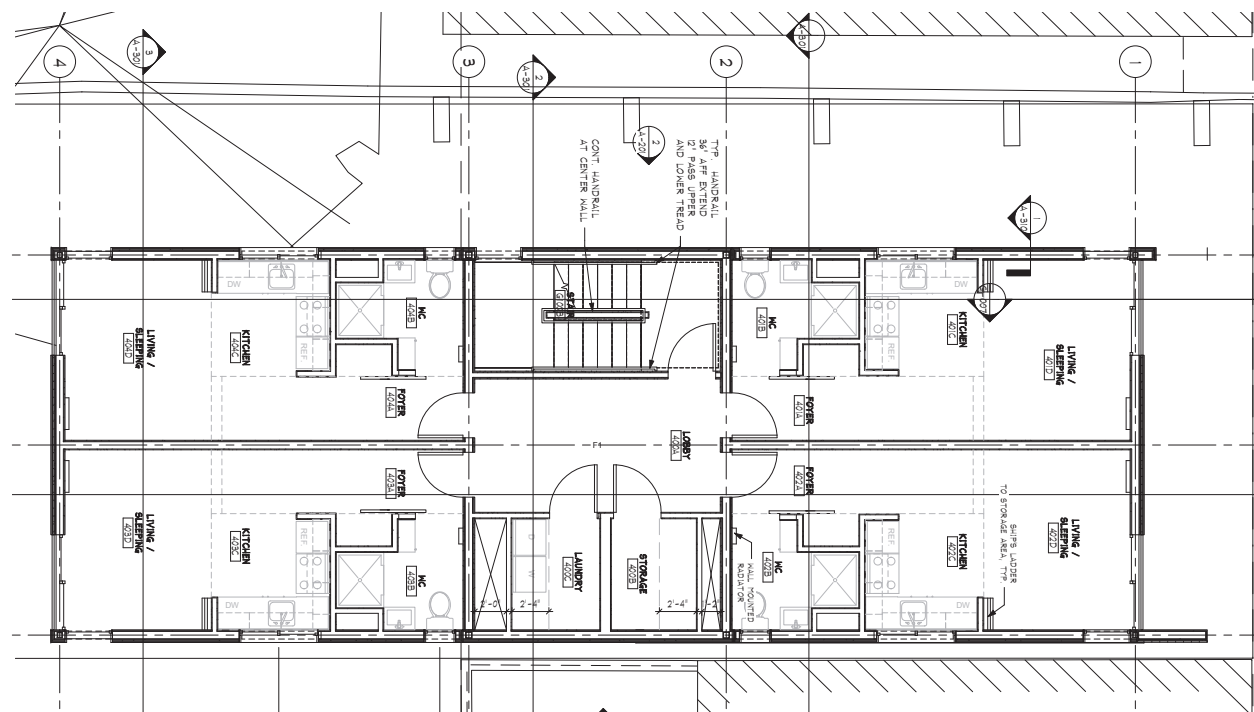


Figure 52: Typical upper level floor plan for 611 E Howell St (The Arbol Lofts, 611 E Howell St Seattle, WA 98122 2014).

8543 Midvale Ave N:

- LR3 zone
- 2019 permit issued
- 5 residential floors
- 20 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- mostly multi-aspect
- 47' building height



Figure 53: Photo of 8543 Midvale Ave N taken in early 2024.

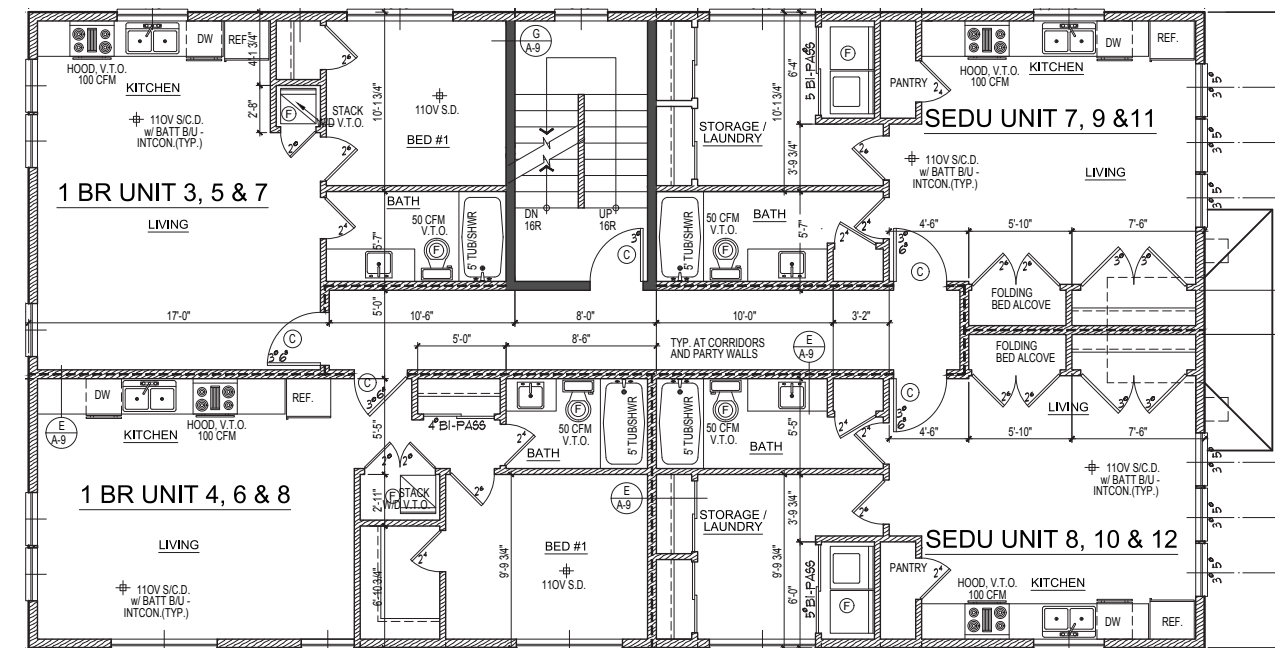
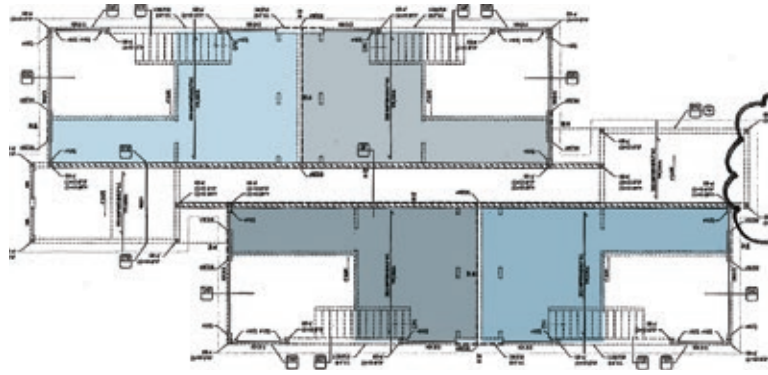
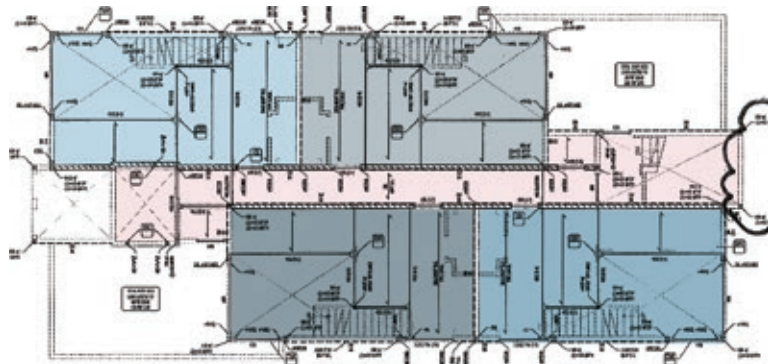


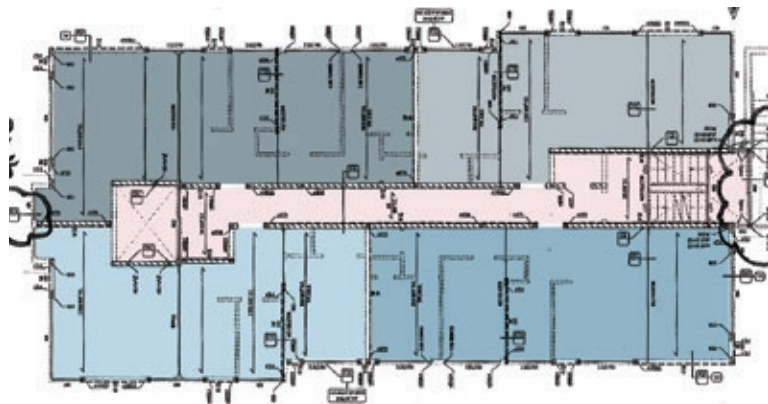
Figure 54: Floors plans of levels 2 through 4 (MUP Plan Set, 8543 Midvale Ave N 2016).



6th floor: upper level of mezzanine units



5th floor: lower level of mezzanine units



typical upper level plan

Figure 55: Partial framing plans for 2224 NW 58th St, overlaid with unit diagram ("City of Seattle Department of Construction and Inspections, Land Use Review, Project # 6489133" 2016).

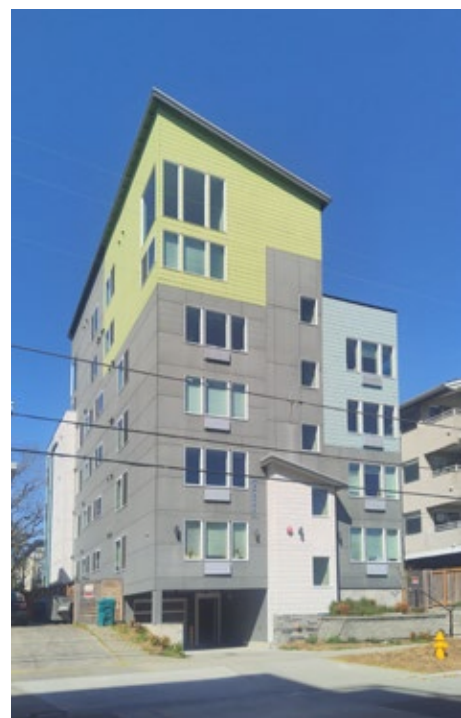
Figure 56: Image of 2226 NW 58th St.

Larger Units:

The larger single-stair buildings tend to have larger units. It is unclear if this is being driven by the units per floor limit in the building code, or if the single-stair is enabling these projects. Many of the larger units are multi-aspect and family-sized.

2226 NW 58th St:

- MR-RC zone
- 2017 permit issued
- 6 residential floors
- 20 units
- 8 FS units
- 0.40 unit ratio (FS to non-FS)
- yes multi-aspect
- NA building height



304 10th Ave E:

- LR3 zone
- 2018 permit issued
- 4 residential floors
- 8 units
- 3 FS units
- 0.38 unit ratio (FS to non-FS)
- mostly multi-aspect
- 43' building height

304 10th Ave E has a mix of unit sizes including several studios; two 2 bedrooms; and a single, two level, large unit that may be an owners suite (shown in darker blue).

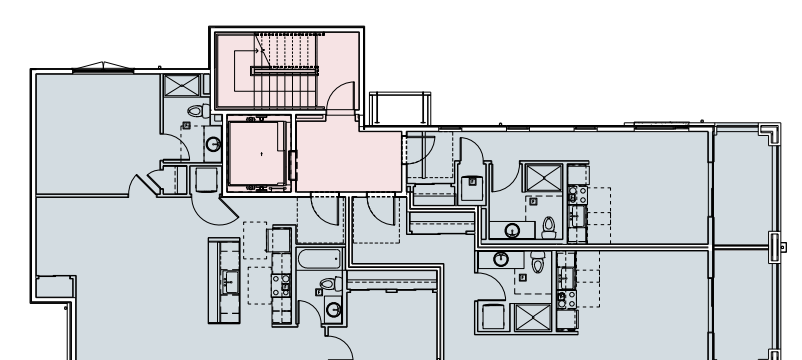
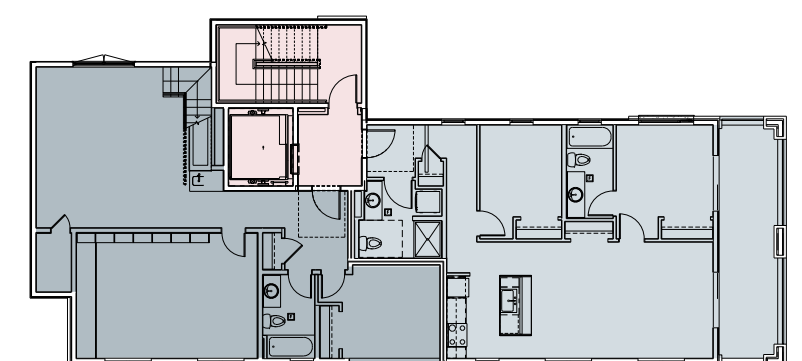
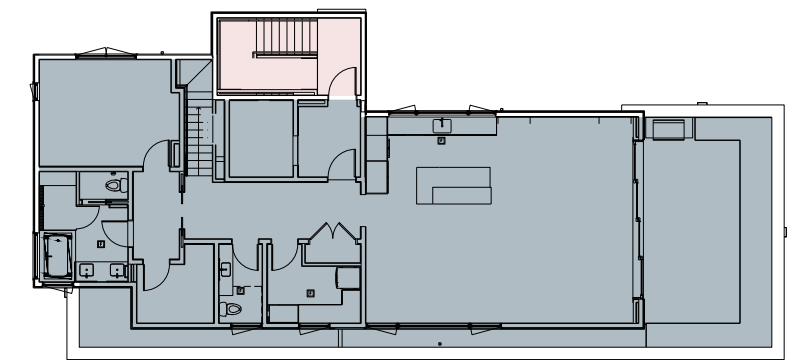


Figure 57: (top) Photo of 304 10th Ave E taken in early 2024.

Figure 58: 2nd - 4th floor plans showing larger units (King Chapman Apartments, 304 & 310 10th Ave E 2018).



Figure 59: Images of 1720 12th Ave Capitol Hill Urban Cohousing, taken from Schemata Workshop's website ("Capitol Hill Urban Cohousing" 2022).

1720 12th Ave:
 NC3-40 zone
 2014 permit issued
 4 residential floors
 9 units
 6 FS units
 0.67 unit ratio (FS to non-FS)
 yes multi-aspect
 48' building height

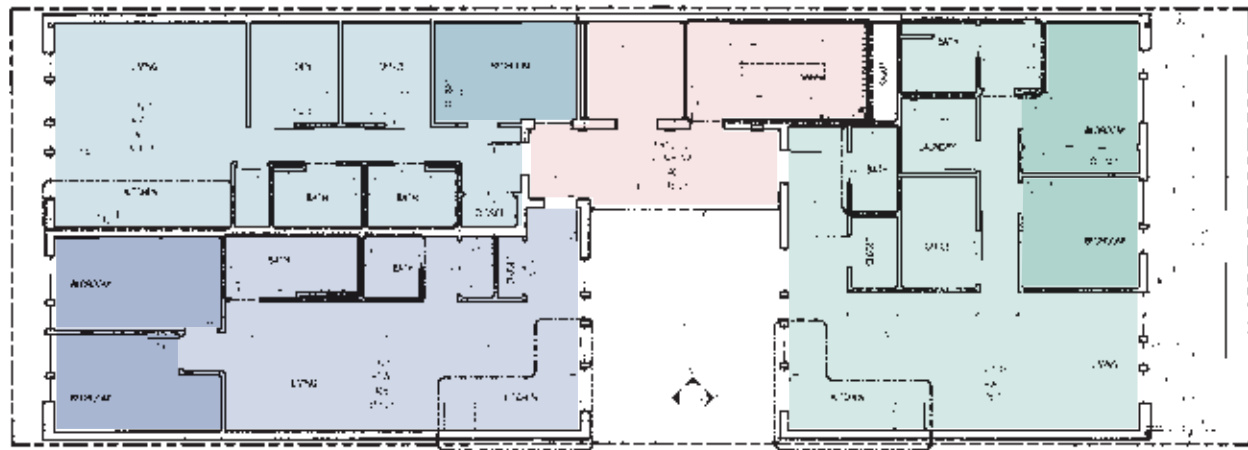


Figure 60: Fourth floor plan showing flexible bonus spaces within units (Capitol Hill Urban Cohousing, 1720 12th Avenue, Seattle, WA 98122 2014).



2351 Franklin Ave E:

LR3 zone
 2014 permit issued
 4 residential floors
 8 units
 8 FS units
 1.00 unit ratio (FS to non-FS)
 yes multi-aspect
 48' building height

Figure 61: Renderings of the sola16 apartments at 2351 Franklin Ave E (Sola16 Apartments, SDR Design Guidance Proposal 2013).

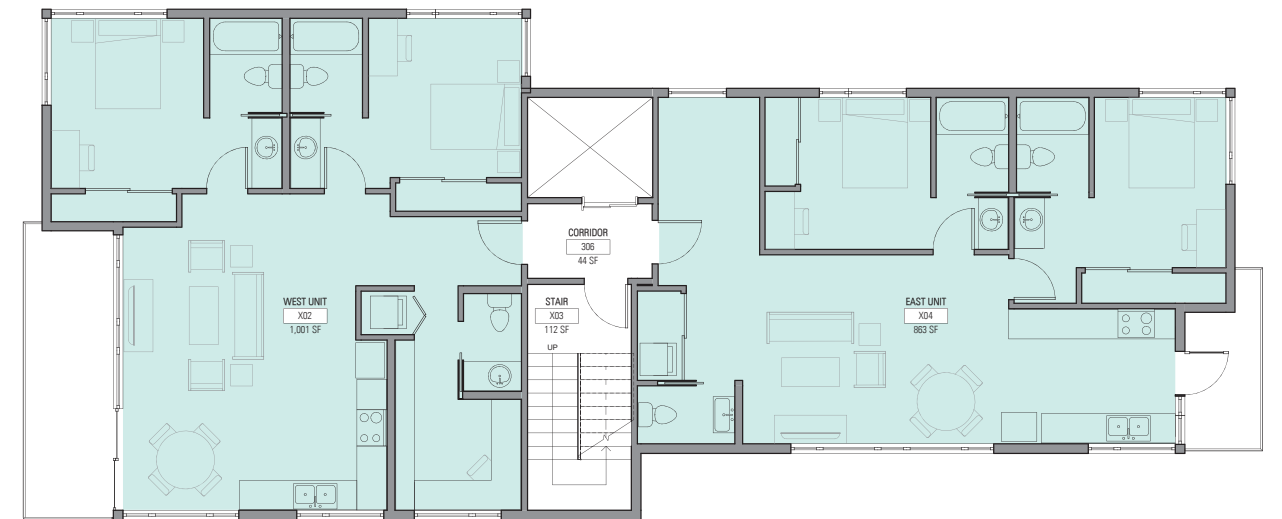


Figure 62: Third and fourth floor plans showing large, 2br units (Sola16 Apartments, SDR Design Guidance Proposal 2013).



This project features several two bedroom units, but does not see the benefits of multi-aspect units found in many other single-stair and smaller midrise projects. This is because the zero side setbacks require firewalls that make adding windows difficult or impossible.

Figure 63: Image of 3208 Rainier Ave S showing zero side setbacks and fire wall.

3208 Rainier Ave S:

- SM-65 zone
- 2017 permit issued
- 3 residential floors
- 12 units
- 6 FS units
- 0.50 unit ratio (FS to non-FS)
- no multi-aspect
- 49' building height

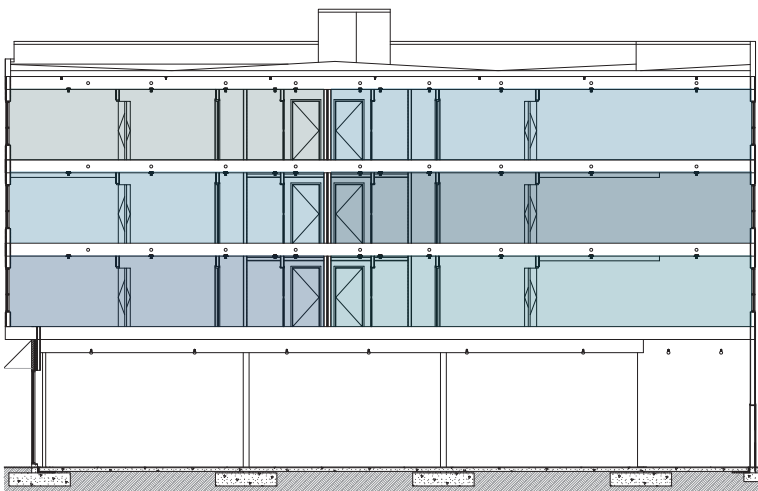


Figure 64: Section showing 3 floors of residential over first floor commercial space ("Plan Review No. 63480, Automatic Fire Sprinkler and Standpipe System - Nem, Rainier Ave Mixed-Use" 2017).

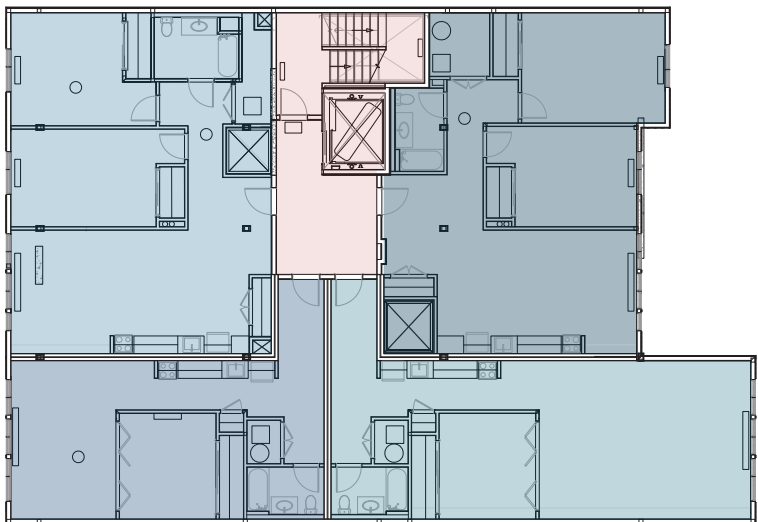


Figure 65: Upper level plan showing 1 & 2 br units ("Plan Review No. 63480, Automatic Fire Sprinkler and Standpipe System - Nem, Rainier Ave Mixed-Use" 2017).

One Bedrooms:

The one bedroom units in most of these buildings are generous, multi-aspect apartments. In small spaces and difficult lots, single-stair buildings create more rentable floor area and more flexibility to create better units.

614 13th Ave E:

- LR3 zone
- 2019 permit issued
- 6 residential floors
- 20 units
- 3 FS units
- 0.15 unit ratio (FS to non-FS)
- yes multi-aspect
- 51' building height



Figure 66: South elevation for 614 13th Ave E ("614 13th Ave E Apartment Building, Seattle, WA 98102" 2023). The sloped site creates opportunities for a partially exposed basement level and additional partial stories at the back of the site.

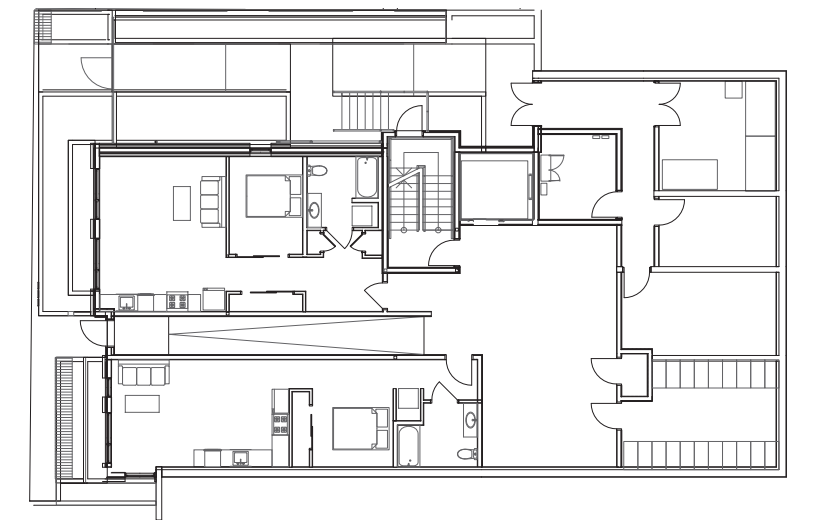
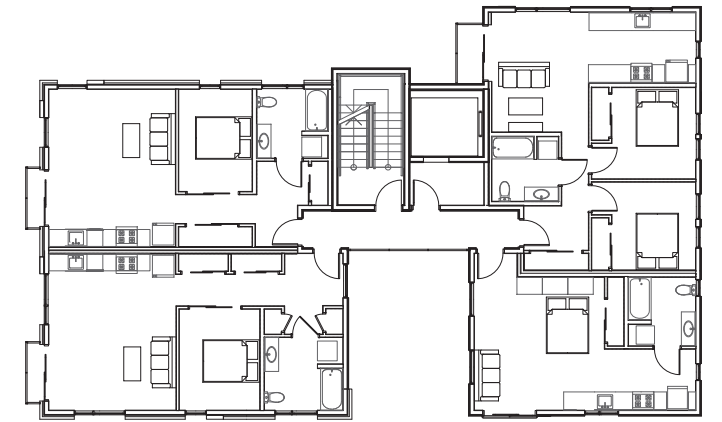


Figure 67: Partial floor plans for 614 13th Ave E ("614 13th Ave E Apartment Building, Seattle, WA 98102" 2023).



Figure 68: Recolored render of the 101 John St Apartments (101 John, Mater Use Permit Set 2013).

101 John St:
 NC3-65 zone
 2015 permit issued
 5 residential floors
 20 units
 5 FS units
 0.25 unit ratio (FS to non-FS)
 mostly multi-aspect
 66' building height

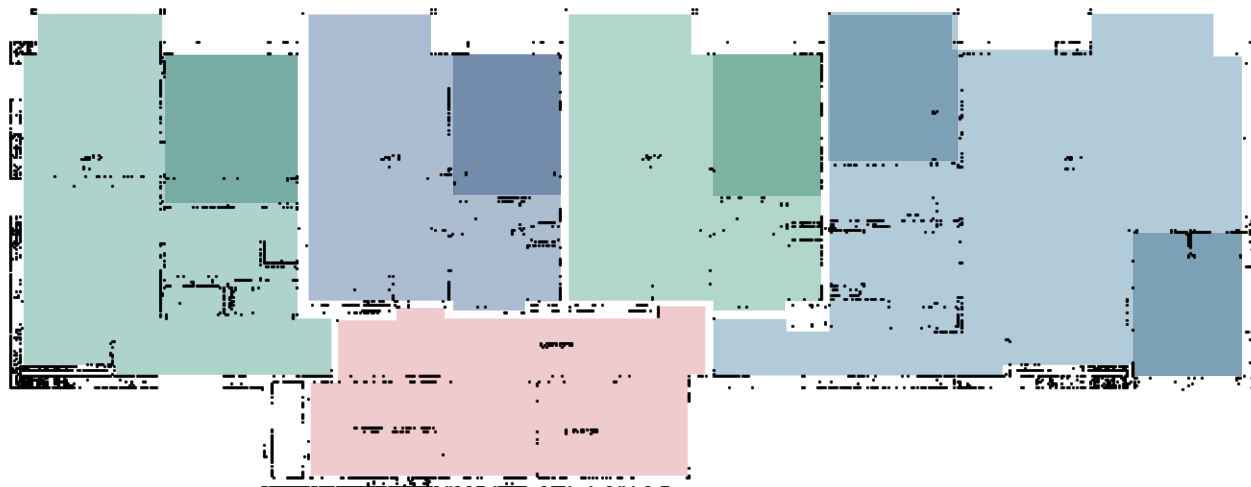


Figure 69: Typical upper level plan (101 John, Mater Use Permit Set 2013).



200 NE 65th St:
 LR2 zone
 2022 permit issued
 4 residential floors
 15 units
 3 FS units
 0.20 unit ratio (FS to non-FS)
 yes multi-aspect
 42' building height

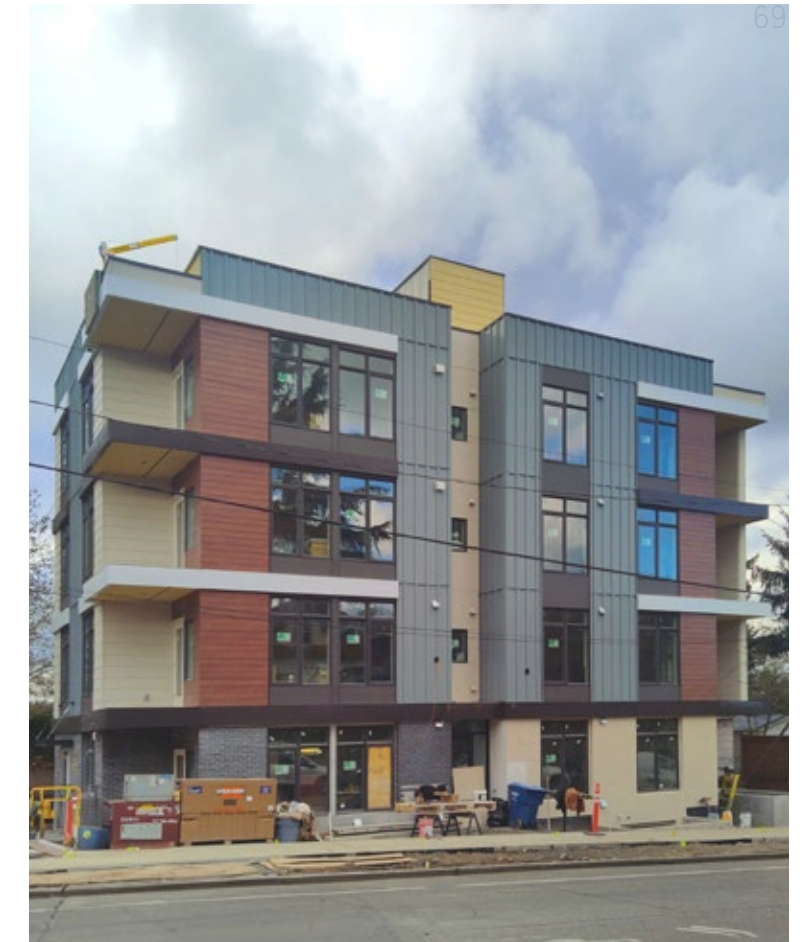
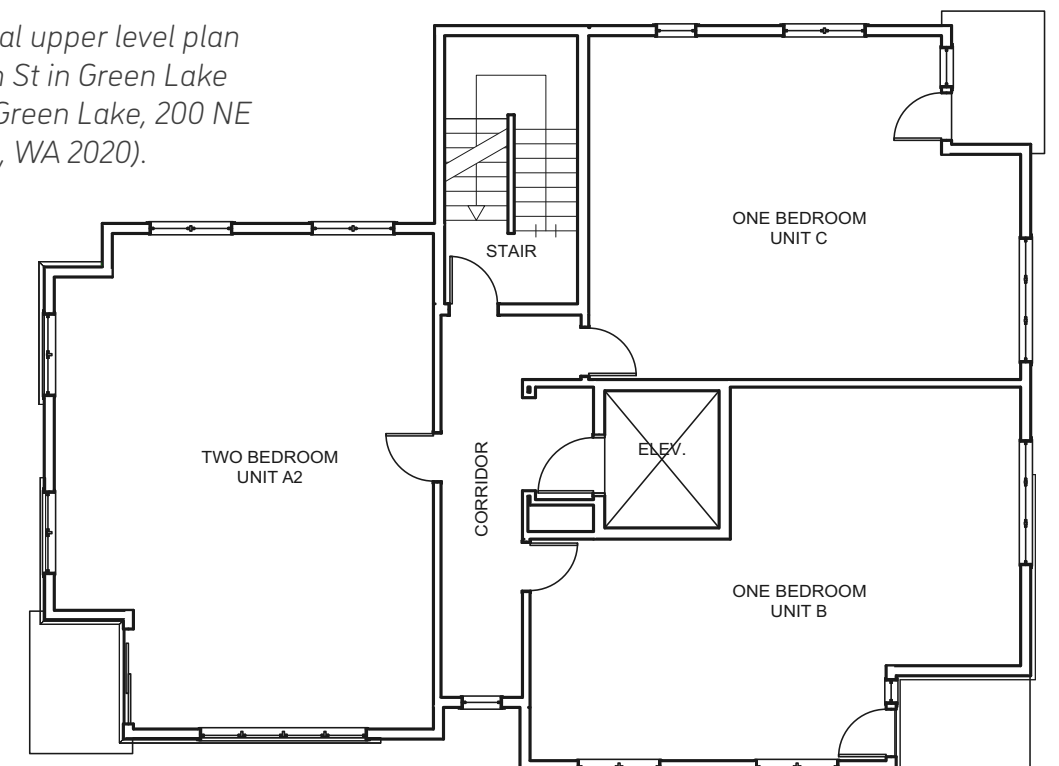


Figure 70: Images of 200 NE 65th St under construction in early 2024.

Figure 71: Typical upper level plan for 200 NE 65th St in Green Lake (The Martin at Green Lake, 200 NE 65th St, Seattle, WA 2020).





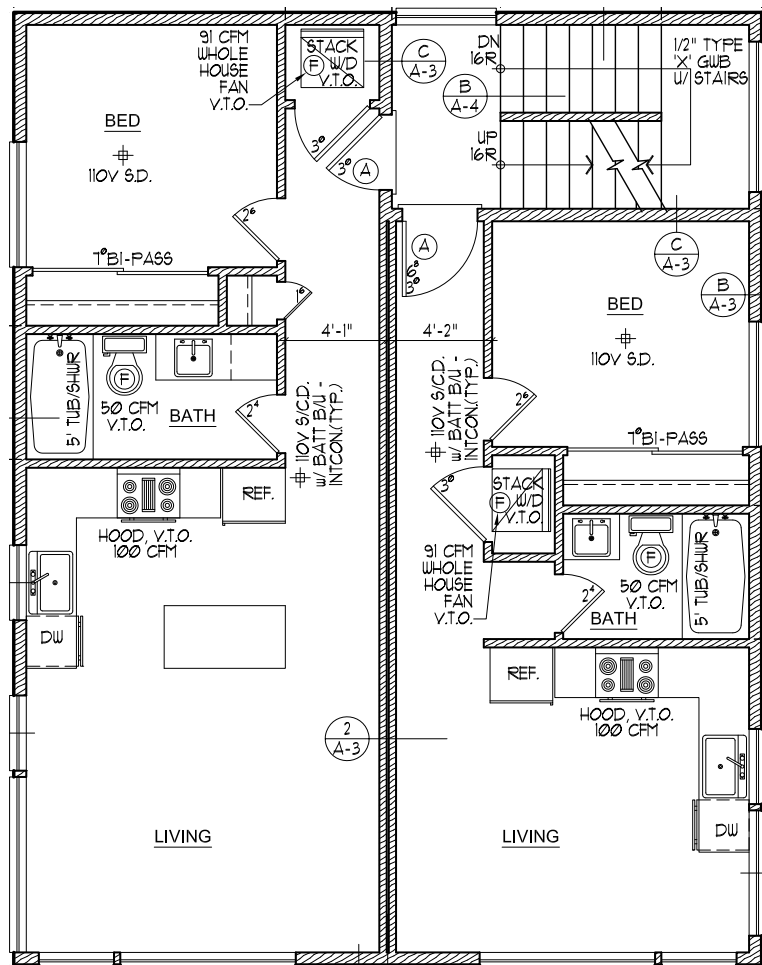
3837 Evanston Ave N:

- LR3 zone
- 2014 permit issued
- 4 residential floors
- 8 units
- 0 FS units
- 0.00 unit ratio (FS to non-FS)
- yes multi-aspect
- 38' building height

There are two identical buildings on this lot, presumably with the same layouts. All of the units are one bedroom.

Figure 72: (top) Photos of 3837 Evanston Ave N. There are many trees on this block and surrounding the project, giving a feeling of living in a forest.

Figure 73: Typical floor plan for 3837 Evanston Ave N (# 3016373 @ 3835 Evanston Ave N. (Conflux #13028) 2014).

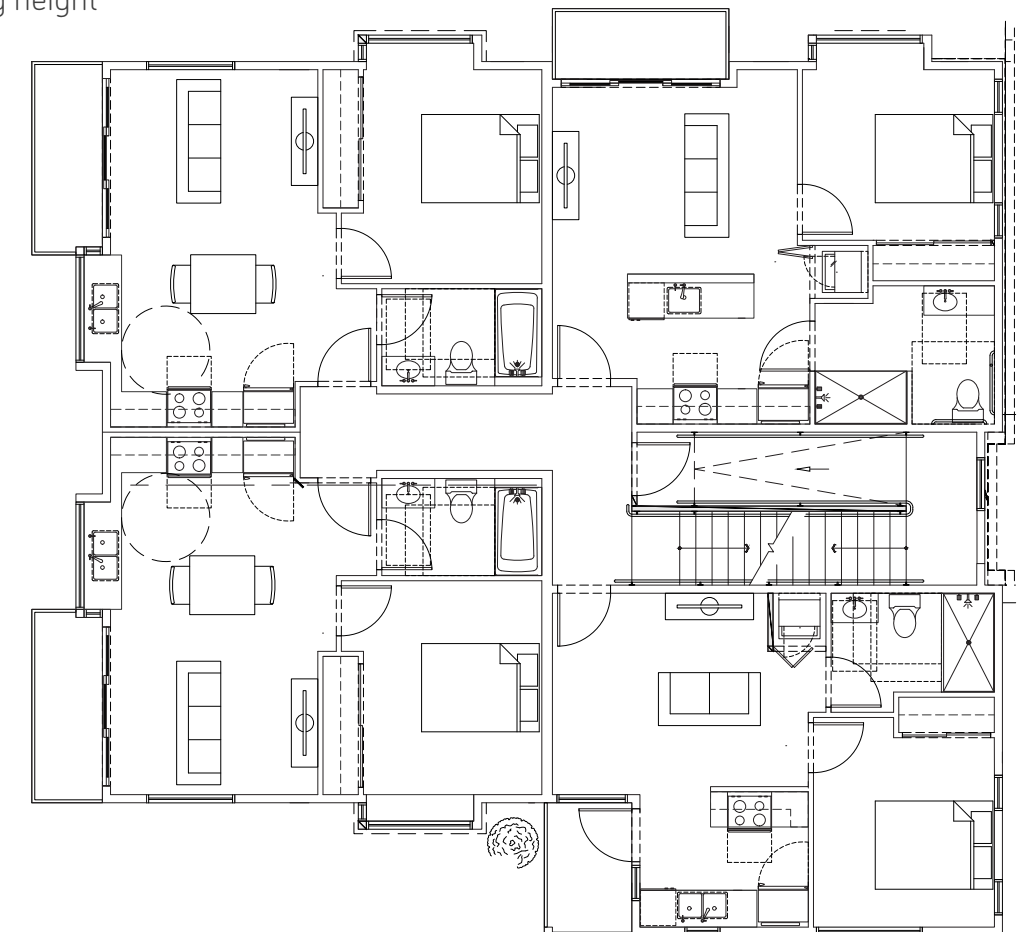


1800 MLK Jr. Way:

- LR2 zone
- 2022 permit issued
- 3.5 residential floors
- 14 units
- 2 FS units
- 0.14 unit ratio (FS to non-FS)
- mostly multi-aspect
- 52' building height

Figure 74: Image of the project under construction in spring of 2024.

Figure 75: (below) Typical floor plan for 1800 MLK Jr. Way (1800 MLK Way Apartments, 75% Permit Documents 2019).



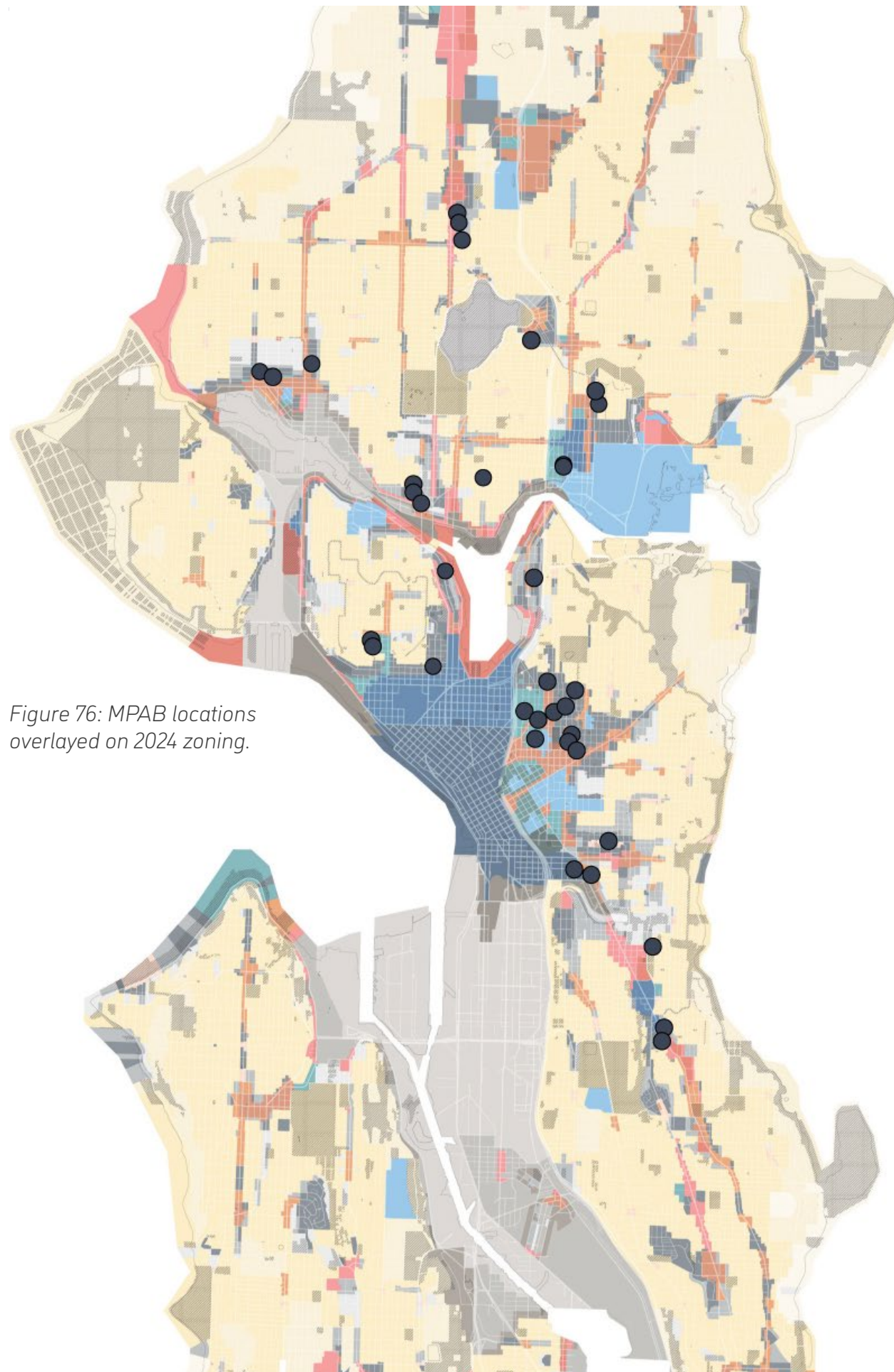


Figure 76: MPAB locations overlaid on 2024 zoning.

locations

Figure 76 shows the locations of the MPABs identified in this survey. Many of them are clustered in rapidly densifying neighborhoods, likely a result of only looking at midrise permits from the last ten years. Even so, it is interesting to note how many of these are built in the Capitol Hill area.



general observations

The major takeaway from this survey came from sifting through so many two stair buildings alongside the single-stair buildings. Most of these projects have very similar massing, dictated by the volumetric zoning regulations found in Seattle's multifamily zones, as well as the size and aspect ratio of most of the city's lots. Seattle's midrise projects are, unsurprisingly, long, boxy rectangles with wedges of space at the side yards. On the outside, these buildings tend to look similar regardless of their stair count.

It has been interesting to note, however, that many of the two stair projects observed would have had more efficient circulation had they been designed as point access buildings. It would seem that developers opt for more, smaller units over efficiency in circulation space, even when this equates to only one or two more units per floor than the four permitted by code around a single-stair. This indicates that unit size and count, as dictated by economic and social factors, are what really drive the floor plans of Seattle's multifamily housing. While building and zoning code do play a major role in shaping those floor plans, the inefficiencies and other manifestations of these regulations are only part of what shapes these buildings.

the typical Seattle midrise

As described above, the majority of the midrise apartments that were observed are two stair buildings with approximately twenty five to thirty five small units. The following is a brief summary of some of the typical patterns that were observed during this survey.



Fifty Two Apartments, 20th Ave NE



Greta Apartments & Juno Studios (SEDUs), 20th Ave NE



Aubrey Studios (SEDUs), 20th Ave



aPodment Suites (SEDUs), 15th Ave NE



Greenlake Village Apartments



Greenlake North Apartments, NE 72ns St.

Figure 77: Photos of recent multi stair development in the north University District & Green Lake areas.



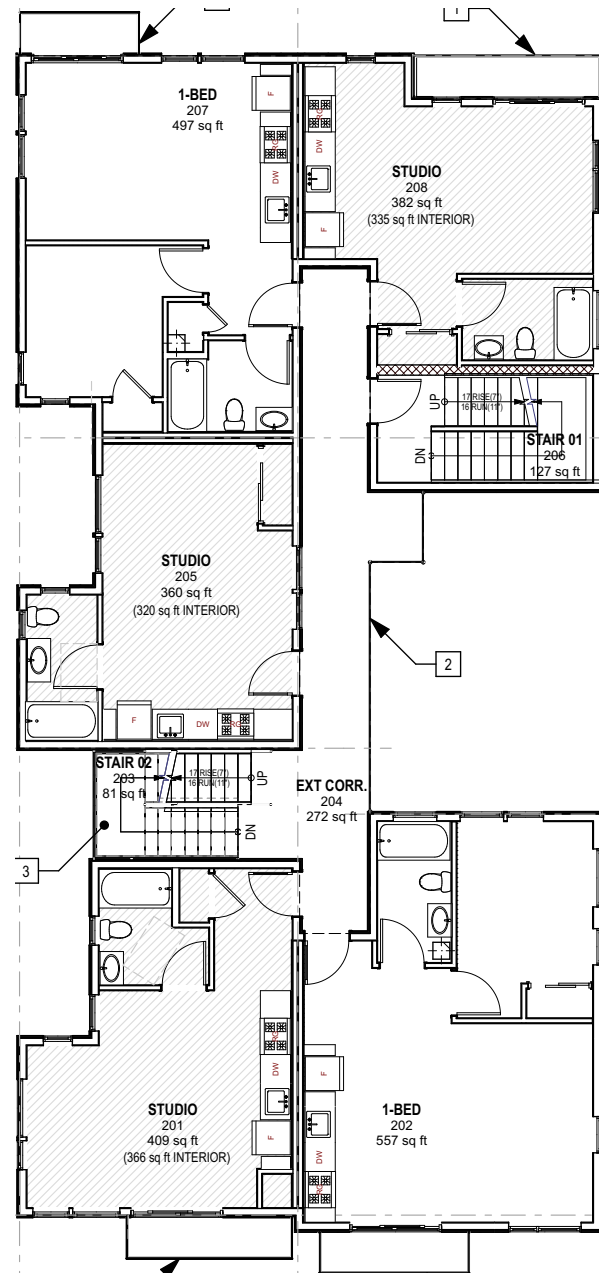
Figure 78: Rendering of project, taken from B9 Architects' website ("NW 60th Street Apartment," n.d.).



1439 NW 60th St:
 LR3 zone
 2022 permit issued
 4.5 residential floors
 22 units
 0 FS units
 0.00 unit ratio (FS to non-FS)
 mostly multi-aspect
 48' building height

This project demonstrates the prioritization of a higher unit count over unit size or circulation efficiency. The basement level contains four units, the first level, three units, and each of the three upper levels contains five units. The one extra unit on these three floors requires the use of a second stair, per building code. Coincidentally, this project is under construction across the street from 1436 NW 60th st, a single-stair infill project.

Figure 79: Typical upper level floor plan (1439 NW 60th St, Apartment Building 2018).



3084 SW Avalon Way:
 MR zone
 2021 permit issued
 7 residential floors
 35 units
 0 FS units
 0.00 unit ratio (FS to non-FS)
 some multi-aspect
 66' building height

3084 SW Avalon Way has, on average, six small studio units per floor. This tall, slender tower could have been designed as a single-stair project with larger units, but the unit count would have been much lower, and the sloped site in combination with single-stair residential floor restrictions would have made it difficult to maximize the FAR and height potential. In short, designing this project as family-sized housing would have required major economic sacrifices, even if it would have resulted in subjectively "better" units.

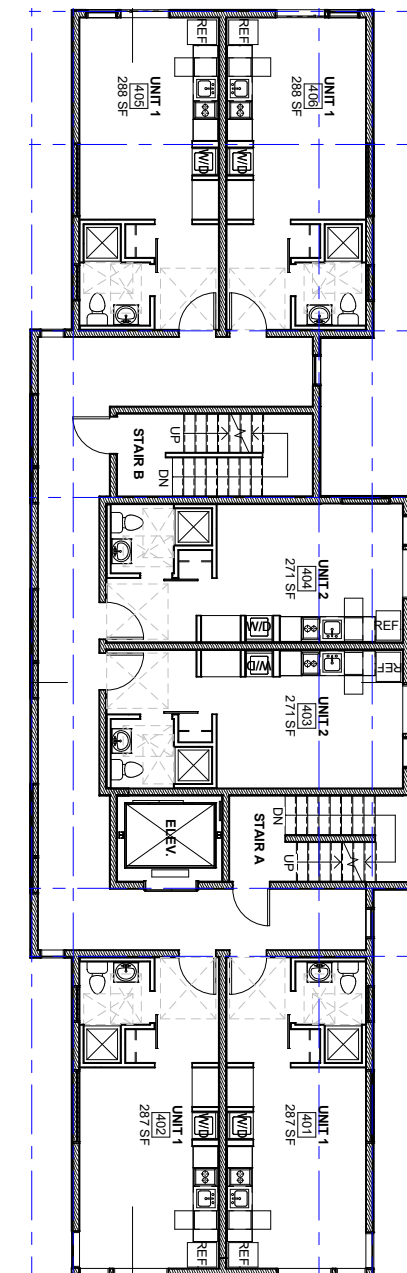


Figure 80: (above) elevations showing relationship to grade (Avalon Apartments, MUP Set 2018).

Figure 81: Floor plan for levels 4 through 7 (Avalon Apartments, MUP Set 2018).

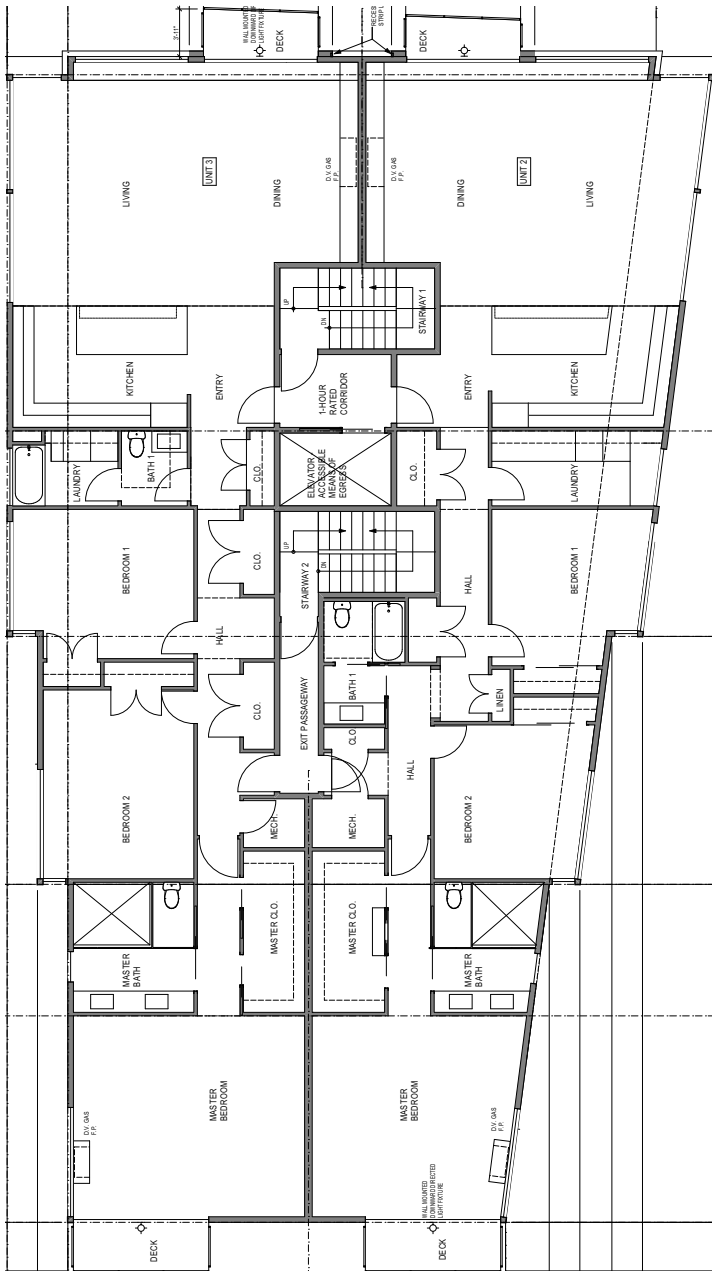


Figure 82: Image of 1118 Alki Ave SW, taken from "Pinnacle at Alki" rental website ("Pinnacle at Alki," n.d.)

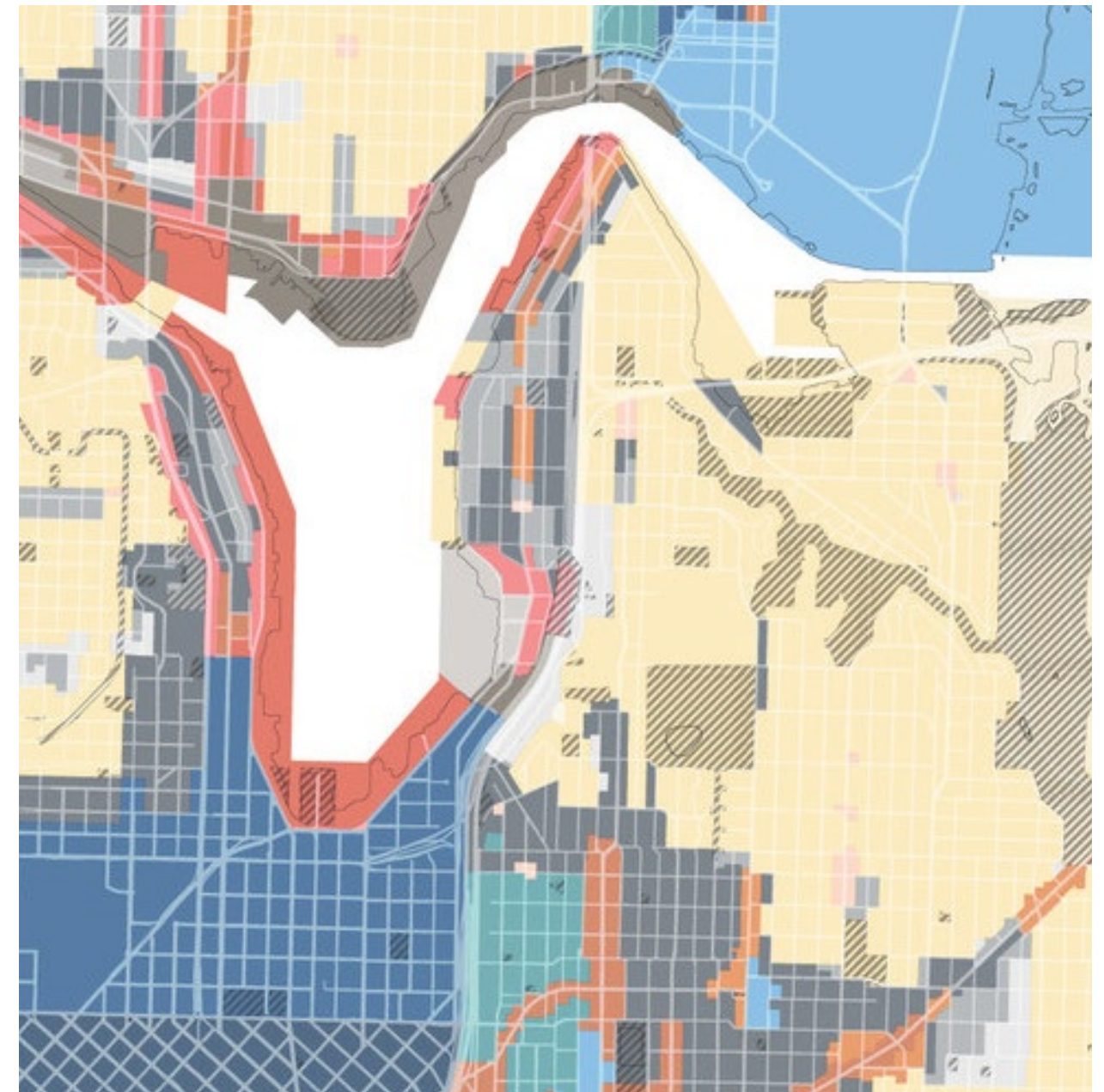
- 1118 Alki Ave SW (condo)
- MR zone
- 2017 permit issued
- 6 residential floors
- 11 units
- 10 FS units
- 0.91 unit ratio (FS to non-FS)
- mostly multi-aspect
- 62' building height

The "Pinnacle at Alki" condominiums illustrate two things. First, a second stair has been fit into the plans in order to build six floors of residential access. Second, building such large units requires exceptional economic circumstances. Based on the website, these units appear to be either investment properties to be rented out, or vacation homes. The highly desirable location makes this sort of development feasible. These units would almost certainly no be built in a more typical Seattle situation.

Figure 83: Typical upper level floor plan showing large, three bedroom units (1118 & 1122 Alki Ave, Southwest, Condominiums 2016).



4. Existing Land Use Code Review



Based on the explorations so far, there appear to be two primary factors for why Seattle's midrise buildings take their typical form and layout, and why they do not usually produce family-sized rental units: regulations and economics. This chapter will give an overview of the land use code that forms part of the regulatory context for these buildings, dictating what is even possible to build. The other force at play, real estate economics, is explored in the architecture thesis portion of this project.

Seattle's land use code, as is typical of many large municipalities, is highly complex. The following summary is not all inclusive by any means, but does give a basic sense of what each of the city's low to mid density residential zones allows.

background

Seattle's formerly single-family zones were rebranded as Neighborhood Residential (NR) in 2021 ("New Zoning Name – Neighborhood Residential Zones" 2022). The change was in name only; density limits still define these lots as having a single, primary residence. Residential Small Lot (RSL) zoning was expanded and modified in 2019 with the goal of creating more, smaller homes that might be more affordable. During the same time, a small portion of single-family lots in urban villages were upzoned to Low Rise 1 ("Seattle's Residential Small Lot Zoning Is Happening" 2019) (Bertolet 2018). Beyond these small adjustments, Seattle's single-family zones have remained largely untouched since their creation in 1923 (Eliason 2019). Low Rise 1 (LR1) zone density limits were reduced or removed at the same time that RSL zones were expanding, as part of Mandatory Housing Affordability (MHA) legislation ("MHA Zone Summaries," n.d.). Due to the city's historically residential development patterns and their evolution over time, most of Seattle's multifamily housing is built in mid-density zones.

An interesting side effect of these changes over the years is the differences in density regulation that have emerged. NR and RSL zones regulate density based on unit counts, i.e. 1 or 2 units per lot. Multifamily zones, including LR2, LR3, and MR, do not have limits on unit density. LR1 zones limit unit count for townhouses, rowhouses, and any development in non-MHA areas, but because the majority of multifamily zoning is in MHA areas, this still allows for apartment with as many units as possible in much of Seattle. These differences in regulation, while creating much needed space in the code for more units, has had the effect of creating smaller and smaller apartments while larger rental homes and ownership opportunities remain limited and unaffordable. This puts pressure on Seattle's families to find the space they need at a price they can afford.

The following is a summary of the existing land use code, as of 2024, for Seattle's NR, LR, and MR zones. While this summary is by no means all inclusive, it will give a sense of the basic massing and unit counts aloud in much of Seattle, as well as a base line for discussion later on.

existing zone descriptions

Figure 83: Chapter 23.44 - Neighborhood Residential

NR Zones	
Floor Area Ratio	(for lots with a single-family home as the principal use): Lots smaller than 5,000sf = up to 2,500sf of floor area Lots greater than 5,000sf = .50 FAR Exemptions (non-exhaustive): stories or portions of stories that are underground, or that extend no more than 4' above grade (lower of existing of finished grade), are exempt from FAR calculations.
Density Limit	1 primary unit, 2 ADUs
Lot Area Minimums	NR1 = 9,600sf ; NR2 = 7,200sf ; NR3 = 5,000sf These lot designations correlate to the previously used SF9600, SF72000, and SF5000. Historic lot exception 23.44.010.B.1.d: lots created prior to 1957 are not subject to these minimum requirements, but instead must be at least 2,500sf
Lot Coverage Limits	lots smaller than 5,000sf = 15% of lot area. Lots greater than 5,000sf = 35% of lot area.
Height Limits	Lots less than 30' wide = 25' from grade Lots greater than 30' wide = 30' from grade, +5' for pitched roofs and dormers.

Setback Minimums	<p>Front yard = 20', or the average of neighboring setbacks.</p> <p>Rear yard = the lesser of 25' or 20% of the lot depth, but no less than 10'</p> <p>Side yards = 5'</p>
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RSL Zones

Floor Area Ration	<p>.75 FAR</p> <p>50% of floor area of homes built prior to 1982 is exempt</p>
Density Limit	<p>1 unit for every 2,000sf of lot area, or a minimum of 2 units per lot.</p> <p>Each principal unit may have 1 ADU.</p> <p>For the majority of existing Seattle residential lots, this results in a maximum of 4 to 6 units. However, there is no minimum lot area so lots could be subdivided with 4 units per lot.</p>
Unit Size Limits	<p>2,200sf including any associated ADU, but excluding partially exposed basements.</p>
Lot Area Minimum	<p>none.</p>
Lot Coverage Limits	<p>50% of lot area.</p>
Height Limits	<p>30' from grade.</p>
Setback Minimums	<p>Front yard = 10'</p> <p>Rear yard = 10' or 0' if there is an alley</p> <p>Side yards = 5'</p> <p>Ground oriented units with street facing facades must have a primary entrance on that facade, towards the street.</p>

Figure 84: Chapter 23.45 – Multifamily

All Multifamily Zones	
MHA Note	<p>Almost all multifamily lots have an MHA suffix.</p>
FAR Exemptions	<p>Partially exposed basements, as defined in NR zones, are exempt from FAR calculations.</p> <p>Single-family homes built prior to 1982 are exempt from FAR calculations, per section 23.45.510.D.3</p> <p>(Other FAR exemptions may apply)</p>
Amenity Areas	<p>Apartments and townhomes in LR zones: 25% of lot area, at least 50% of which must be at grade.</p> <p>The amenity area for townhouses and rowhouses may be private, as in individual balconies.</p> <p>LR zone amenity areas cannot be enclosed within a structure</p> <p>Amenity areas must be at least 250sf, with a minimum dimension of 10'</p>
Green Factor	<p>LR zones = .60</p> <p>MR zones = .50 (see section 23.86.019)</p> <p>Street trees, or larger trees within the lot, must be retained or added for all new development.</p>
Design Standards	<p>Street facing facades greater than 750sf must be articulated into multiple planes. Planes must have a minimum area of 150sf.</p> <p>Apartment entry orientation: common entries must face street or courtyard. Entries must be visually prominent through architectural features, e.g. porches, roofs, etc.</p> <p>(Other design standards may apply)</p>

Separations

Minimum separation between structures in LR and MR zones: 23.45.518.F

Minimum separation between structures on the same lot, besides cottage housing = 10'

If structures are separated by a driveway, the minimum separation is 2' more than the driveway width requirement, with exceptions.

LR1 Zones

Floor Area Ration

With MHA = 1.30 FAR

Without MHA = 1.00 FAR

Density Limit

Townhomes and non-MHA lots = 1 unit per 1,150sf of lot area

Low-income housing: 1 unit per 400sf of lot area

MHA lots & apartments: none

Family-sized Units

Family-sized unit requirements: Apartments with 4 or more units = One 2br unit of at least 850sf is required for every 4 units in the structure, or one 3br unit of at least 1,050sf can be used in place of two required 2br units.

Lot Coverage Limits

none.

Height Limits

Apartments: 30' +5' for hipped or gabled roofs, +3' for butterfly roof

Setback Minimums

Front yard: 5'

Rear yard: 10' with an alley, 15' without an alley

Side yards: facades less than 40' long = 5' ; facades greater than 40' long =7' average, 5' minimum

Structure Width

Apartments: 45' maximum

Townhomes: 60' maximum

Facade Length

The combined length of all portions within 15' of a side lot line must be less than 65% of the lot line (all LR zones).

LR2 Zones

Floor Area Ration

With MHA: 1.4 FAR, or 1.6 if outdoor amenity space equal to 35% of the lot area is provide

Without MHA: 1.10 FAR

Density Limit

Townhomes and non-MHA lots = 1 unit per 1,300sf of lot area

MHA lots: none

Lot Coverage Limits

none.

Height Limits

Apartments in MHA zones: 40'

Apartments not in MHA zones: 30'

+5' for hipped or gabled roofs, +3' for butterfly roofs

+4' for structures including a partially below grade story, with exceptions.

Setback Minimums

Front yard: 5'

Rear yard: 10' with an alley, 15' without an alley

Side yards: facades less than 40' long = 5' ; facades greater than 40' long =7' average, 5' minimum

Upper level setbacks (LR2, LR3): Front: 12' back above 44' in zones with 40' limits; 12' back above 54' for zones with 50' limits ; Side/ rear: 12' back above 34' if abutting NR zone

Structure Width	Apartments and townhouses: 90'
Facade Length	The combined length of all portions within 15' of a side lot line must be less than 65% of the lot line (all LR zones).

LR3 Zones

Floor Area Ration	<p>Outside Urban Villages, with MHA: 1.8 FAR</p> <p>Outside Urban Villages, without MHA: 1.3 FAR for apartments, otherwise 1.2</p> <p>Inside Urban Villages, with MHA: 2.3</p> <p>Inside Urban Villages, without MHA: 1.5 FAR for apartments, otherwise 1.2</p>
Density Limit	<p>Townhomes and non-MHA lots = 1 unit per 800sf of lot area</p> <p>MHA lots: none</p>
Lot Coverage Limits	none.
Height Limits	<p>Apartments outside UCs, UV,s and Station Area Overlays, with MHA = 40' ; without MHA = 30'</p> <p>Apartments inside UCs, UV,s and Station Area Overlays, with MHA = 50' ; without MHA = 40'</p> <p>+5' for hipped or gabled roofs, +3' for butterfly roofs</p> <p>+4' for structures including a partially below grade story, with exceptions.</p>

Setback Minimums	<p>Front yard: 5'</p> <p>Rear yard: 10' with an alley, 15' without an alley</p> <p>Side yards: facades less than 40' long = 5' ; facades greater than 40' long =7' average, 5' minimum</p> <p>Upper level setbacks (LR2, LR3): Front: 12' back above 44' in zones with 40' limits; 12' back above 54' for zones with 50' limits ; Side/ rear: 12' back above 34' if abutting NR zone</p>
Structure Width	<p>Outside UCs, UVs, and Station Area Overlays = 120' for apartments and townhomes</p> <p>Inside UCs, UVs, and Station Area Overlays = 150' for apartments and townhomes</p>
Facade Length	The combined length of all portions within 15' of a side lot line must be less than 65% of the lot line (all LR zones).

MR Zones

Floor Area Ration	<p>With MHA = 4.5</p> <p>Without MHA = 3.2</p>
Amenity Areas	<p>MR zones (residential uses only): 5% of gross floor area</p> <p>MR amenity areas must be common, i.e. accessible to everyone in the building.</p> <p>No more than 50% of amenity areas can be enclosed in a structure.</p>
Density Limit	none.
Lot Coverage Limits	none.

Height Limits	With MHA = 80' Without MHA = 60'
Setback Minimums	Front / side yard: 7' average, 5' minimum, or 0' if there is a courtyard at grade Rear yard: 15' without alley, 10' with alley Upper level setbacks: 15' back above 70' if abutting a street <56' wide
Structure Width/ Depth	For lots greater than 9000sf: Maximum width: 150' Maximum depth: 80% the depth of the lot, with exceptions

Figure 85: Chapter 23.54.015 – Parking

Residential Parking Requirements	
Single-family Parking	1 space per dwelling unit
Multifamily Parking	1 space per dwelling unit, or 1 space per 2 SEDUs
Exceptions	No parking is required if any of the following is true: The residential use is within an Urban Center or a Station Area Overlay District The residential use is within a commercial or RSL zone, or within an Urban Village, and it is within a frequent transit service area. Other exceptions apply for specific locations, lot sizes, and affordable housing.

discussion

The survey of existing MPABs illustrates how single-stair buildings are currently fitting into Seattle's multifamily zones, in particular, the LR3 zone. Neighborhood Residential does not permit the unit density necessary for single-stair buildings to be a logical solution. It is feasible, with a large enough lot, that single-stair stacked flats could be built in an RSL zone, however it is highly unlikely. Regulations for accessory dwelling units would make it difficult or impossible to use them in a stacked flat situation.

Under anticipated changes required by HB 1110, NR zones would permit up to 4 units, or 6 with proximity to transit, or if two are affordable. Low rise single-stair buildings could be used for these sixplexes but smaller building types such as townhomes, duplexes, and cottage housing will likely a more cost effective way of meeting these new density standards because they can be built with residential building code. It is unlikely that upcoming changes will significantly change how MPABs fit into Seattle's zoning code. These and other changes will be discussed in the next chapter.

The family-sized unit requirement in the LR1 zone, while well intentioned, can make it difficult for the project to be financially feasible (Khouri 2024). This requirement may be stunting multifamily development in LR1 zones, and would be better suited to larger developments that might be able to absorb the cost of the larger units more easily.

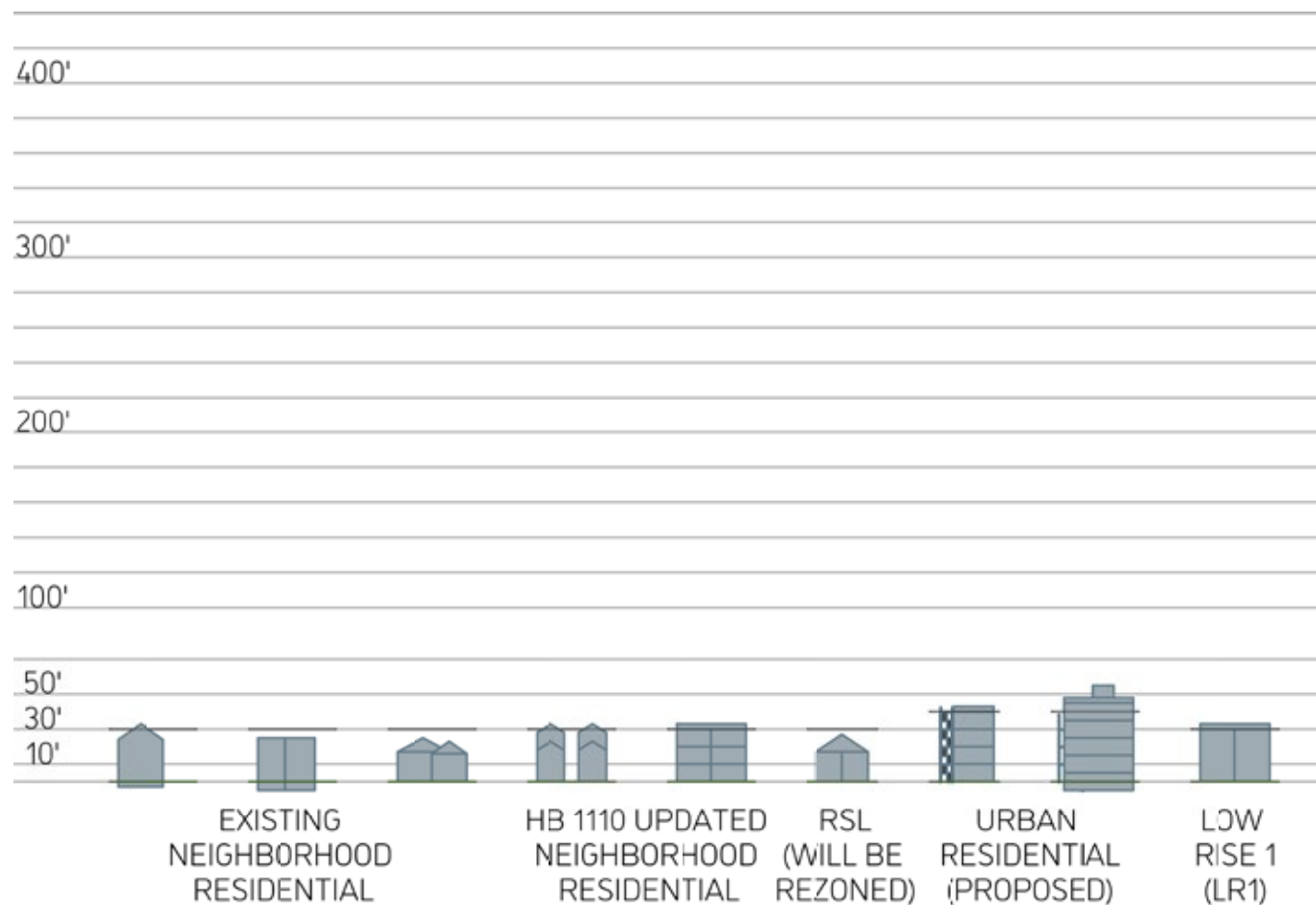
Figure 86: observed MPAB heights compared to zoned heights

built height	zoned height	zone
38'	40'	LR3 Hub Urban Village
38'	40'	LR3 Hub Urban Village
42'	40'	LR2 (M1) Residential Urban Village
43'	40'	LR3 (M) Outside Villages
43'	40'	LR3 Urban Center
44'	40'	LR3 Urban Center
44'	40'	LR3 Hub Urban Village
45'	40'	LR3 Residential Urban Village
47'	40'	LR3 Residential Urban Village
48'	40'	LR3 Residential Urban Village
48'	40'	LR3 Residential Urban Village
48'	40'	NC3-40 Urban Center
48'	50'	LR3 (M) Hub Urban Village
49'	65'	NC3-65 Urban Center
50'	50'	LR3 (M) Urban Centre
51'	40'	LR3 Urban Center
52'	30'	LR2
52'	50'	LR3 (M) Residential Urban Village
53'	50'	LR3 (M) Urban Center
53'	50'	LR3 (M) Hub Urban Village
59'	50'	LR3 (M) Urban Center
64'	60'	MR Urban Center
64'	75'	DMR/C 75/75-170 Urban Center
69'	60'	MR Urban Center
70'	60'	MR-RC Hub Urban Village
73'	80'	MR (M) Urban Center

Once LR2 and LR3 scales are reached, it is practical to build MPABs, as has been observed through the survey. However, single-stair buildings are still relatively uncommon in these zones because of their inability to produce higher unit counts under the current building code.

The effective removal of unit density limits in Seattle’s multifamily zones, coupled with economic forces that will be explored in the architecture thesis, has led to smaller rental units. It could be argued that the quality of Seattle’s apartments has suffered from smaller floor areas and a lack of access to light and air. While small units play a vital role in addressing Seattle’s housing shortage, they cannot be the only solution. Larger apartments with more bedrooms and more windows enable families or group living, and allow for lower carbon footprints through shared space, shared resources, and passive ventilation. A wider variety of apartments also incentivizes a wider variety of people to live densely, which is necessary for a more climate friendly future.

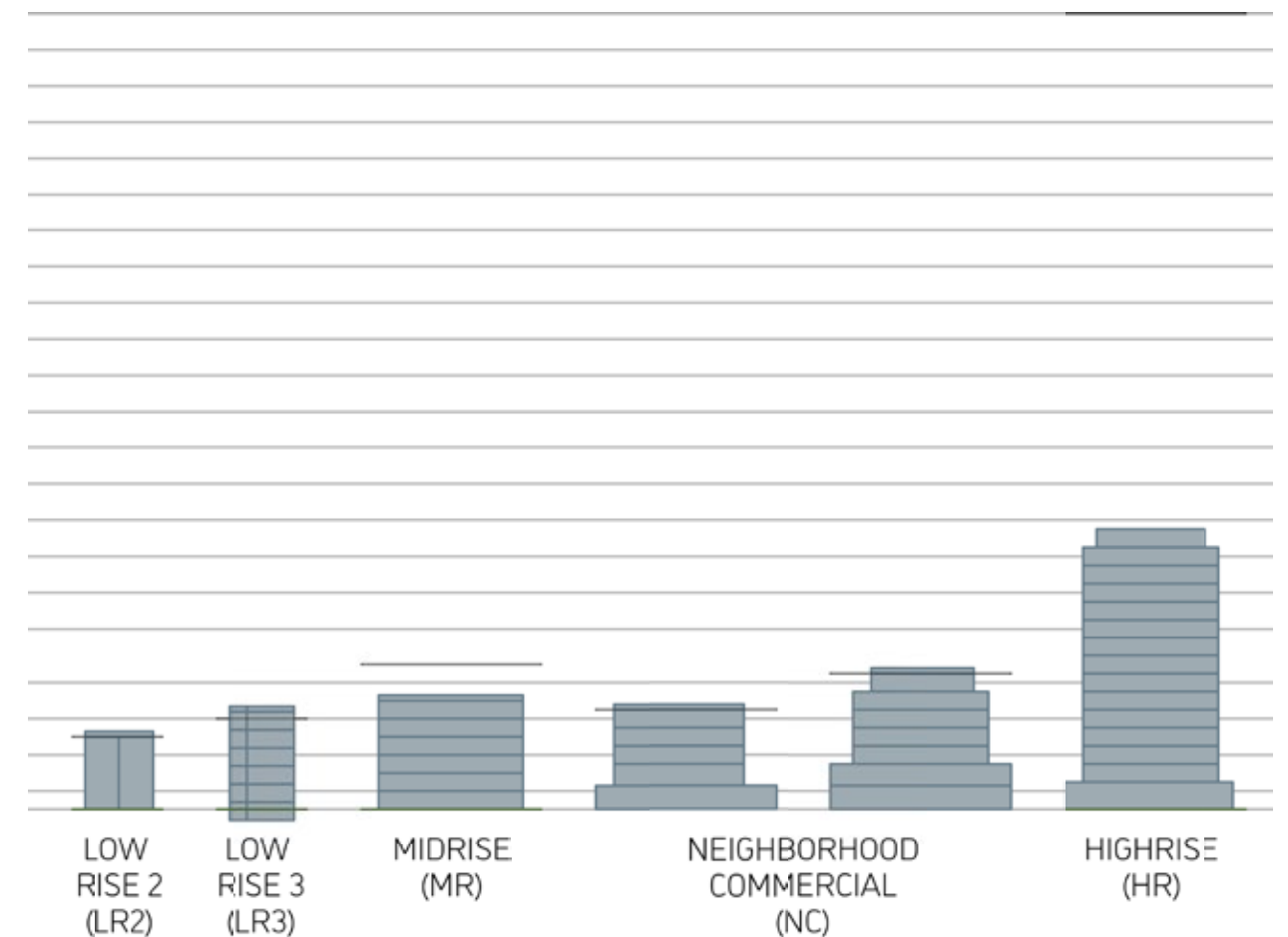
The use of volumetric regulations in building codes, along with the need to maximize rentable floor space and the use of stick framing, has led to boxy apartments buildings across the country (Fox 2019). Whether or not these buildings are desirable is subjective and debatable, but unless Seattle drastically alters it’s regulations to something closer to a form based code, these buildings will continue to be the norm.



Use of a form based code could be explored as a means of producing buildings that fit the community’s collective aesthetic desires more closely. A form based code, if done well, also has the potential to create a clearer regulatory framework. Creating clarity and utilizing design standards at the beginning of the development process rather than part way through, as Seattle’s system currently functions, may reduce time and money spent on design. Less time and money spent at any point in the development process has the potential to increase the production of housing.

Under current conditions, it can be assumed that most multifamily development will be built out to the maximum allowable envelope and density, or very close to. Exceptions to this will occur when building code limits materials and methods which in turn can substantially increase the cost of building bigger, to the point where maximizing built space is no longer the most cost effective approach (MR zone in fig 87). With all of this in mind, regulations can and should be written as not only defining the exterior of the building, but also, to a large extent, defining what is inside the building. Regulations could limit unit density while maintaining FAR to encourage larger units. Lot coverage could be decreased, and height limits increased to dictate taller, skinnier buildings and units with more access to light and air. Alternatively, lot coverage and height could be increased while maintaining FAR in order to create more

Figure 87: (below) conceptual transect of Seattle’s residential zones showing height limits, potential built heights, and other elements of building form.



variation in building form and the potential for more upper level step backs which may lead to more patios and roof decks. Ultimately, our zoning and building codes have the potential to work together, leveraging and balancing economic drivers, to produce the cities we desire, from the neighborhood scale all the way down to our living spaces and bedrooms, but this potential is not being realized with current regulations.

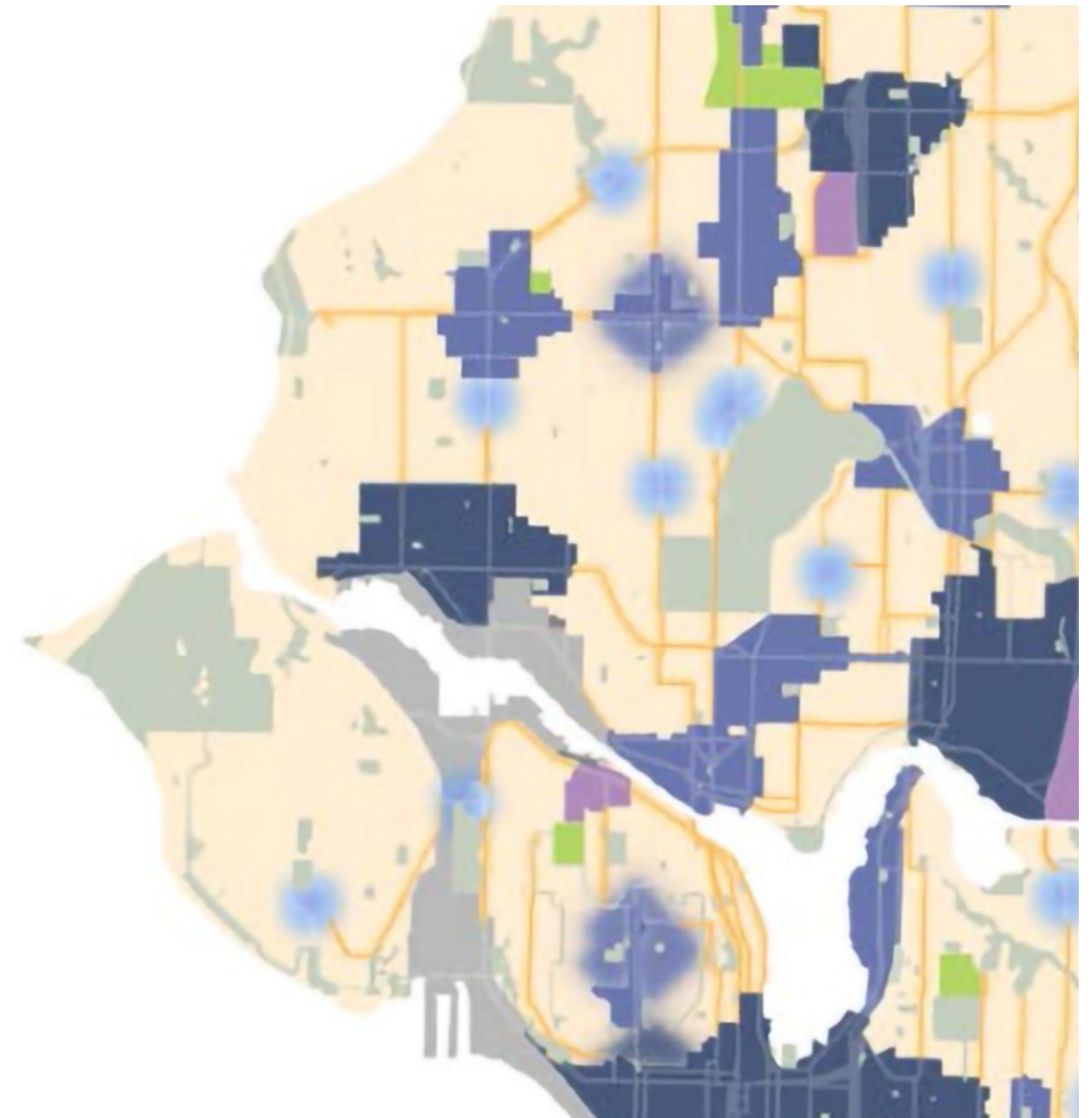
transect

Figure 87 is a conceptual transect of Seattle's zones, illustrating a potential typical massing response to the regulations defining each zone. Each potential massing attempts to maximize built FAR and reflect other driving factors. These include use of pitched roofs where they are encouraged in the code; smaller structures that could be built under residential code and seen as more desirable for home buyers; maximizing floor space while keeping buildings short enough to use less expensive construction methods such as stick framing or five-over-one construction; and, in the case of higher density zones, reducing building widths to enable shallower residential floor plans.

In several zones, height limits have not been maximized for a variety of reasons. In the RSL zone, the maximum unit size and floor area limit the height. In the MR zone, the building is kept to a height that can be constructed using five-over-one methods (although built heights will likely increase as amendments to Seattle's building code are used more widely). In the HR zone, base FAR keeps the building from reaching the 440' height limit. Addition of affordable units would enable more height through FAR bonuses in the HR zone.

This transect is intended to further illustrate how building codes and zoning codes do not currently work together to maximize our housing stock and its quality. The proposed new zone is included in the transect to show how it is intended to fit into the gradient. The new zone will be fully described in Chapter 6.

5. Anticipating a New Context



comprehensive plan update & HB 1110

Seattle is currently in the process of updating its comprehensive plan and making major zoning changes. A draft plan was made public at the beginning of March 2024 and public feedback will be gathered over the next few months. This project will use the draft plan and accompanying documents for reference in this section: the "One Seattle Plan comprehensive plan update: Draft for Public Review", "Updating Seattle's Neighborhood Residential Zones: A Proposal to Increase Housing Choice and Fulfill Requirements of House Bill 1110," and the "Growth Strategy Summary."

Some of the changes that have been worked into the plan relate to the requirements of HB1110, which has mandated unit density increases for most of Washington's single-family zones. In Seattle, these changes will be to allow 4 to 6 units per lot, by right, in most or all formerly single-family zones, depending on affordability and proximity to transit ("Final Bill Report E2shb 1110" 2023).

The broad upzones that are likely to result from the update will make more space in the city for single-stair buildings, especially where multiplexes will be permitted, however, based on FAR information in the "Updating Seattle's Neighborhood Residential Zones" document, it is unlikely that the units in these multiplexes will be family-sized. "Family-sized" has been defined as at least 850sf, 2 or more bedrooms, and gathering space ("Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle" 2014). It is also a fair assumption that most of these four unit developments will be built as detached structures or duplexes in order to use cheaper construction under residential code, and more appealing ownership options. In other words, any single-stair, stacked flats multiplex unit will probably be in buildings of more than four units. The city is proposing an FAR of .9 for all developments of three units or more, which results in maximum unit sizes of 900sf for 5 units and 750sf for 6 units. Due to inevitable inefficiencies for utility and circulation spaces, units will probably be closer to 700 or 800sf. It is likely that many of the lower density developments, up to four units, will produce family-sized units, but again, these will probably be built for ownership, making them relatively unaffordable.

A key concern of advocates for higher unit counts in NR zones is whether the middle housing types that will become legal will be built extensively. Developers may have no interest in building fourplexes and sixplexes if they don't produce enough return on investment, a concept that is explored further in the architectural portion of this project. There are also well-founded concerns that, even if these buildings are built, the increase in density will not be substantial enough to address the city's housing shortage, and that the new units will be prohibitively expensive for most renters.

This project is proposing an additional zone designation which would allow for a greater number of units to be built in buffer areas between NR zones, and multifamily and commercial zones with higher density and height limits. This new zone would permit eight to ten units and adjust volumetric regulations to create more space so units can be larger. The goal of this zone is to incentivize efficient, family-sized units and higher levels of density in formerly single-family neighborhoods. The hope is that the

increased density will be more appealing for developers, resulting in more construction, more units, and more space for all sorts of Seattleites.

a closer look at HB1110

The language of the legislation mandates that Seattle will increase the allowable density of single-family zones to 4 or 6 units, depending on access to transit and affordability:

For cities with a population of at least 75,000 based on office of financial management population estimates: (i) The development of at least four units per lot on all lots zoned predominantly for residential use, unless zoning permitting higher densities or intensities applies; (ii) The development of at least six units per lot on all lots zoned predominantly for residential use, unless zoning permitting higher densities or intensities applies, within one-quarter mile walking distance of a major transit stop; and (iii) The development of at least six units per lot on all lots zoned predominantly for residential use, unless zoning permitting higher densities or intensities applies, if at least two units are affordable housing. ("Final Bill Report E2shb 1110" 2023)

There are several exemptions and technicalities that may somewhat reduce the scope of the upzone. There is also a timeline extension for implementation in areas at risk of displacement or with a lack of necessary infrastructure. Lots in critical areas, environmental buffers, or that will be impacted by climate change, such as flooding and wildfires, as well as lots within a 1 mile radius of large airports, are exempt. Accessory dwelling units (ADUs) may be used to achieve these densities, if the city so chooses.

The current wording for the upzone, as stated in the "Updating Seattle's Neighborhood Residential Zones" accompanying document, is somewhat cryptic and could potentially be read as allowing more than 4 units on lots of 6,250sf or more. On page 12, the maximum density for the updated NR zones is proposed at,

1 unit per 1,250 square feet of lot area except that, consistent with state law, at least four units are allowed on all lots, regardless of lot size, and six units within a quarter-mile walk of major transit or if two units are affordable.

The use of "at least" implies that more units could be achieved on larger lots. Lots of this size are less common but do exist in neighborhood residential zones (see fig 93). Over the next several months, as the zoning update progresses, this will likely be clarified.

It is up to Seattle's political leaders to choose how far reaching and intense this upzone will be. Based on the comprehensive plan draft and its accompanying documents, the update will meet the minimum standards of the law. Over the next several months, this may change as more input is gathered from the community, or it may not. Ultimately, the future of Seattle's housing stock will be dependent on how the growth strategy outlined in the plan and accompanying document manifests itself as zoning changes. These zoning changes will be driven by HB 1110 requirements in conjunction with the updated growth strategy.

Neighborhood Residential summary table

zone	existing conditions			
	NR1	NR2	NR3	RSL
minimum lot size	9600sf	7200sf	5000sf	2000sf
unit density	3	3	3	2 per 2,000sf
effective max density	1 per 3,200sf	1 per 2,400sf	1 per 1,667sf	1 per 1,000sf
FAR				0.75
effective FAR for a 5,000sf lot	.55 with 1 principal unit .75 with 1 principal + 1 ADU .95 with 1 principal + 2 ADUs			50% floor area exempt for homes built prior to 1982
/ exclusions				
effective unit size estimates for 5,000sf lot	2,750sf for principal unit			937.5sf
lot coverage	35% for lots 5,000sf or larger OR 15% +1,000sf			50%
height limit	30' + 5' for pitch roof			
front setback	lesser of: average of adjacent buildings OR 20'			10'
rear setback	lesser of: 20% of lot depth OR 25 feet			0' w/ alley OR 10' w/o alley
side setback	5'	5'	5'	5 feet
permitted setback encroachment	uncovered porches, bay windows, architectural details, and covered decks within rear setbacks, with conditions			
open space	none			
effective parking requirement	1 space per 3 units			1 per 2 units

Figure 88: Summary table of existing NR and RSL zones & proposed updates to NR zones from the comprehensive plan update ("Seattle, Washington - Municipal Code, Title 23 - Land Use Code" 2014) ("Updating Seattle's Neighborhood Residential Zones: A Proposal to Increase Housing Choice and Fulfill Requirements of House Bill 1110" 2024).

proposed from comprehensive plan draft*		
4 units	6 units	affordable
4	6	1 per 400sf
TBD, wording unclear		12 on 5,000sf lot
		1.8
.5 for 1 unit ("below 1/4,000sf") .7 for 2 units ("between 1/4,000 and 1/2,200") .9 for 3-6 units ("at least 1 per 2,200sf")		
2,500sf with 1 unit, 1,750sf with 2 units, 1,500sf with 3 units, 1,125sf with 4 units, 900sf with 5 units, 750sf with 6 units		750sf with 12 units
50%	50%	60%
32' + 5' (3 floors)	32' + 5' (3 floors)	4 floors
10'	10'	10'
0' w/ alley OR 10' w/o alley	0' w/ alley OR 10' w/o alley	NA
5 feet	5 feet	5 feet
covered porches, bay window, and balconies		
20% of lot area, no less than 10' minimum dimension		
market driven (none)		

* information from supplemental document, "Updating Seattle's Neighborhood Residential Zones," subject to change based on public comment

a new growth strategy

As part of the initial process for the comprehensive plan update, the city proposed five different growth strategy alternatives that would inform the final outcome of the plan and the resulting zoning reforms. These strategies were outlined in the “Environmental Impact Statement (EIS) Scoping Report” and made public for the community to share feedback on. These alternatives were:

Alternative 1, No Action: a baseline scenario, mostly for the purposes of comparing the other four scenarios.

Alternative 2, Focused: adding more, smaller nodes, called Neighborhood Anchors, that would function similarly to Seattle’s existing Urban Villages.

Alternative 3, Broad: widespread density increases, especially in single-family zones. This would encompass the provisions of HB 1110, and is likely to be one of the strategies the city will ultimately use.

Alternative 4, Corridors: Increased density would be focused around existing transit corridors.

Alternative 5, Combined: this scenario looks at a combination of scenarios 2, 3, and 4 to achieve the most potential growth.

The Growth Strategy Summary for the draft indicates that the city has chosen to use some combination of alternatives 2 and 3. As originally proposed, Alternative

most common housing type expected by place type

	broad neighborhood residential changes	Neighborhood corridors	Neighborhood Anchors	Urban Villages	Urban Centers
detached home	High	Low	Low	Low	Low
duplex, triplex, fourplex	High	Low	Low	Low	Low
townhouse and rowhouse	High	Low	Low	Low	Low
sixplex / 3-story stacked flats	High	Low	Low	Low	Low
4-5-story buildings	Low	High	High	High	High
6-7-story buildings	Low	High	High	High	High
8-12-story buildings	Low	High	High	High	High
highrise buildings (above 12 stories)	Low	High	High	High	High

Figure 89: Reformatted table for the Growth Strategy Alternatives EIS report, showing housing types by place types based on the alternatives proposed in the report (Growth Strategy Alternatives EIS report, Exhibit 4, City of Seattle, 2022).

2, Focused, would involve adding Neighborhood Anchors, which would function like smaller Urban Villages. This scenario would add more housing capacity in high opportunity areas, and create more Pedestrian Overlay Districts, with the goal of achieving a “15-minute city,” essentially a walkable urban environment in which basic needs can be met without the use of a car. In the original Focused scenario, 5 to 7 story apartments would be permitted within a 3 to 4 block (1,000ft) radius of the anchor. This could potentially create opportunities for the use of MPABs with larger units, but would likely see more two stair SEDU buildings because of the existing regulations in multifamily zones and their economic implications. In this alternative, family-sized housing would likely continue to be limited to NR zones or townhomes. However, this would be an excellent application for the new zone this project is proposing, putting young families and larger households closer to their daily needs.

In the draft Growth Strategy document, these nodes have been renamed Neighborhood Centers (pg 4), and substantially reduced, in terms of area (800ft radius

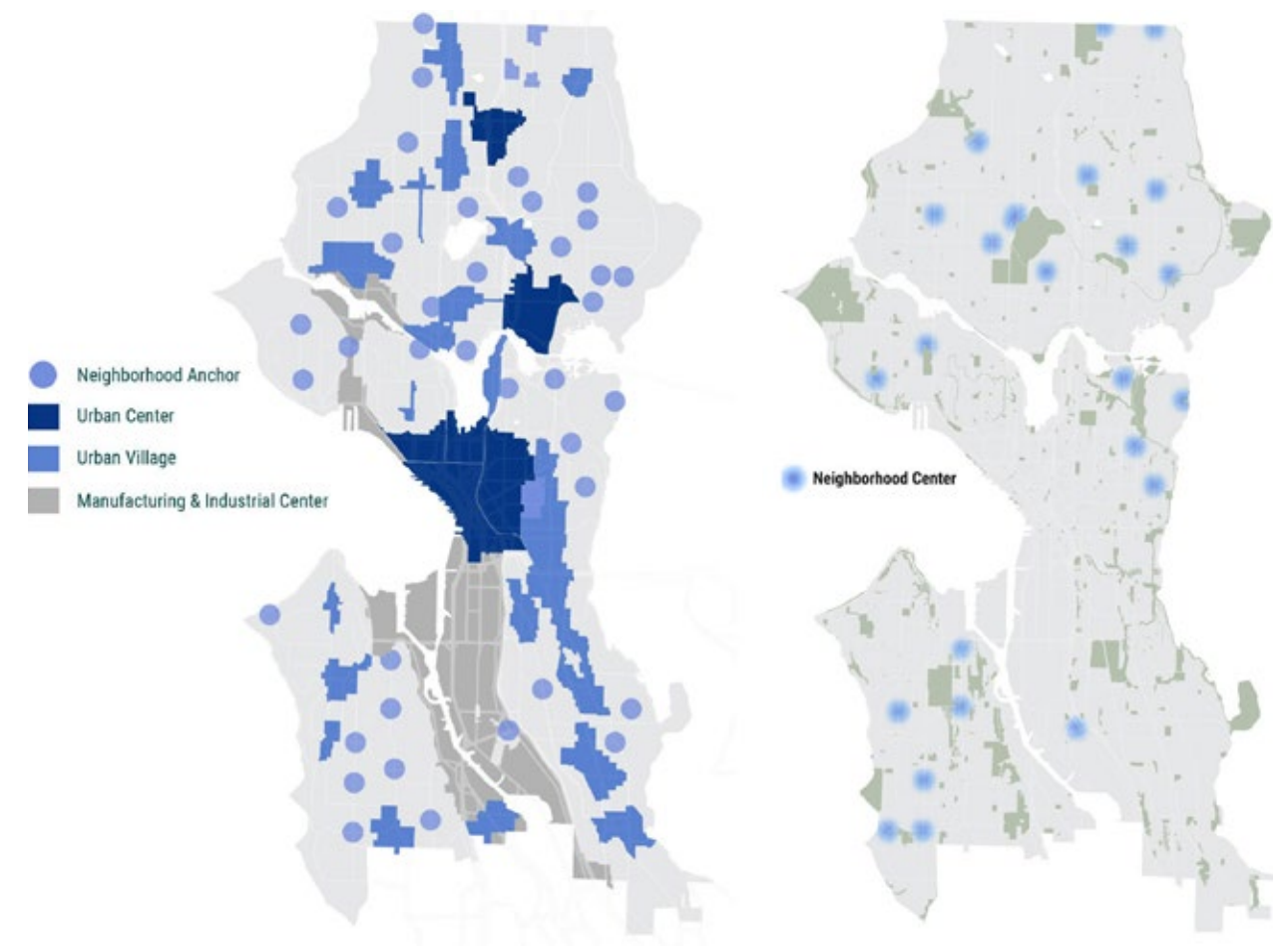


Figure 90: Comparison of Neighborhood Anchor locations from Alternative 5 proposed in the EIS report, and the counterpart, Neighborhood Centers, as proposed by the draft plan (Growth Strategy Alternatives EIS report, Exhibit 4, City of Seattle, 2022) (“One Seattle Plan comprehensive plan update, Growth Strategy Summary” 2024)

as opposed to 1,000ft radius), count (from 38 down to only 24), and density (5 to 7 stories within 1,000ft radius, to 4 and 5 stories within 800ft and 6 stories at the core).

The original Alternative 3, as proposed in the EIS, considers the broad increase in density that is a version of what HB 1110 mandates. Three and fourplexes would be permitted in NR zones. Market rate residential development in these areas would still be confined to three stories, as it is in the existing NR definition. This strategy has not changed significantly in the transition from EIS to draft plan, apart from being renamed Urban Neighborhoods.

It is unfortunate that the city has chosen to use a more conservative growth strategy as there was significant public support for the 5th EIS alternative that would have added more density. Alternative 5 combines elements from options 2, 3 and 4 to create even more density potential across the city. In public engagement sessions, there was substantial interest in this option, with a desire for further density being included via a community proposed "Alternative 6" (Trumm 2022) ("Seattle 2024 comprehensive plan Explorer" 2022).

If Alternative 5 had been used, single-stair buildings could be used as a strategy for many of the multiplexes that would be built, but the existing zoning definitions may still discourage their use for taller buildings and larger units. Seattle's multifamily zones do not have unit density maximums, which tends to produce two-stair buildings with smaller units because they produce more revenue than larger units. As long as the existing zoning designations are used to achieve the new Growth Strategy, Seattle will continue to see the same mix of units built. The increased unit density imposed by HB 1110 will be the only space for new unit configurations to be tested.

implications for the future & recommendations

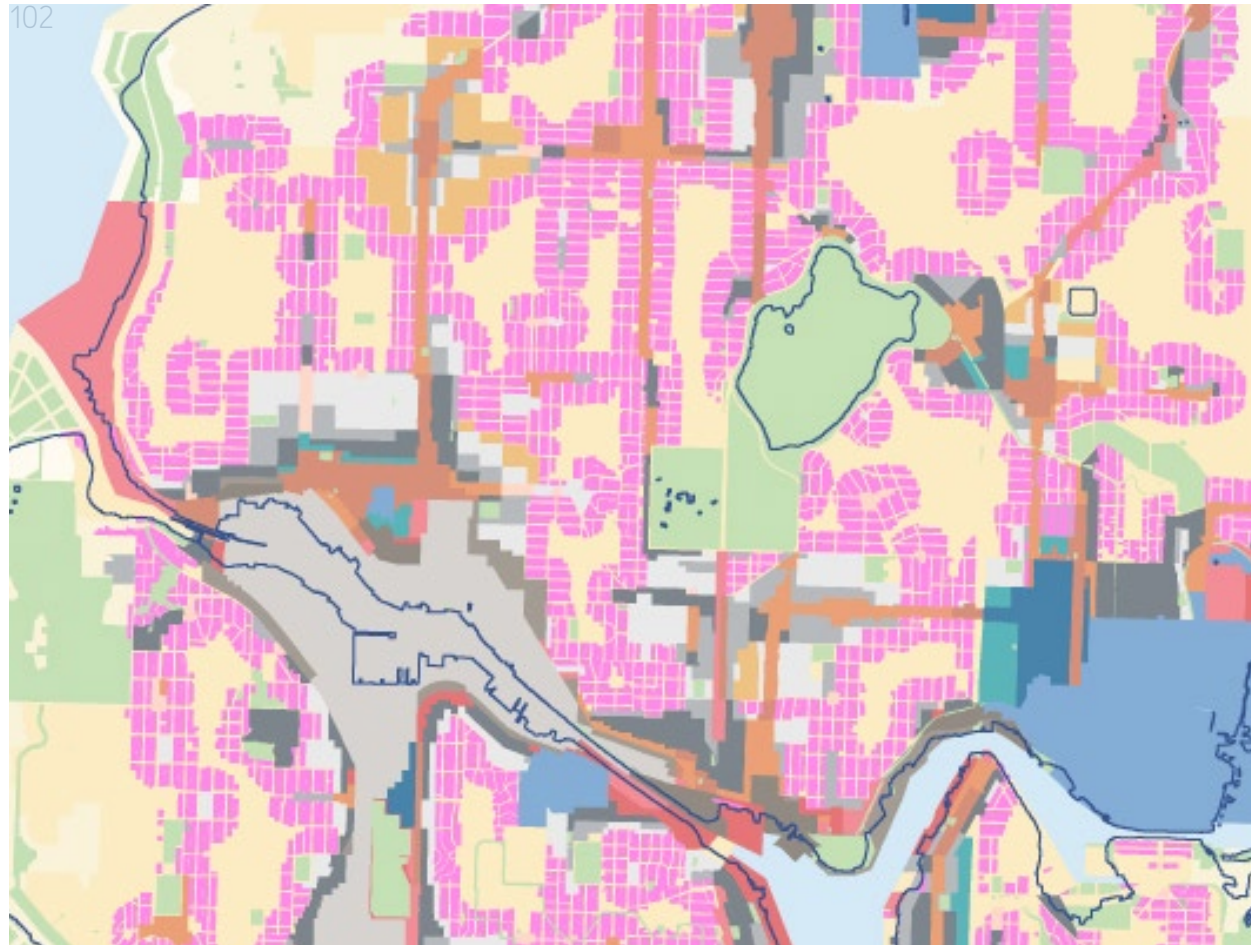
It is likely in all of these alternative that Seattle will see more units built, but in the same configurations that are currently popular. An increase in FAR and height limits in NR zones where unit density will be limited may help to produce larger units. The currently proposed FAR increase scales with unit count, but only up to three units, at which point the units will begin to shrink in order to conform to this cap. Continuing to scale FAR and height limits would allow for larger units to be built in stacked flat multiplexes.

Greater height limits could allow for more vertical buildings, conserving open space and trees. Point access buildings have the advantage of compact vertical circulation that make them the logical answer for these taller, narrower building.

It is also possible that more density will be achieved if new zoning is implemented in and around the new Neighborhood Centers using the Alternative 4 Corridor strategy in conjunction with Alternatives 2 and 3. The Growth Strategy Summary document indicates that this strategy may be used, "to provide more housing options near frequent transit (8)." In Alternative 4, density would be increased along

existing transportation corridors in the form of multiplexes and apartment buildings up to 5 floors. Ramifications for MPAB construction and larger rental units would be similar to those of Alternative 2, but the slightly shorter height limits (5 rather than 7) would lead to fewer or smaller units built with each new building.

Multiple strategies will be needed to achieve more housing at a wider variety of sizes and price points. The proposed Growth Strategy may see more ownership opportunities produced through duplexes and cottage housing. Increased density in parts of the city that are already zoned multifamily, particularly changes that match FAR and lot coverage, and align with building code and construction methods, will help to produce more units in better configurations. Adding the buffer zone this project proposes along the edges of these higher-density zones would create more potential for larger, family-sized units with access to daily needs, amenities, and community spaces. These homes would contribute substantially to a more diverse housing stock while allowing more families to live car-free lifestyles and enjoy the benefits of urban living.



6. Proposal for a New Zone

the Urban Residential zone

The map on the next page indicates parcels in Seattle that could be rezoned to incentivize larger units with more bedrooms, a wider mix of units, and retention of existing homes. This new zone would encourage the use of MPABs as mid-density infill in what are currently single-family, NR zones. The Urban Residential (UR) zone would be a higher density counterpart to Seattle's Neighborhood Residential with the goal of retaining open space while creating a wider variety of units with easy access to daily needs and neighborhood amenity spaces.

As was discussed in the previous chapter, the zoning changes resulting from the comprehensive plan update process will modestly increase unit densities in existing NR zones. The anticipated four to six unit developments will likely take the form of multiplexes or cottage housing. There has been some skepticism that such small projects will be appealing or logical for developers. It is therefore doubtful that the upzone will result in substantially more units. This new zone would permit eight to twelve units per lot and incentivize larger, family-sized units with expanded height and FAR limits.

Urban Residential zoning would allow for MPABs to be used to create more family-sized housing, but that does not necessarily mean these buildings would be built. These buildings face the same economic challenges that currently shape the floor plans of apartments in other multifamily zones. In order to make these buildings more financially feasible, those that meet certain unit mix requirements could be exempt from development fees, ROW improvements, and the costly and time-consuming design review process. Other strategies, including expedited permitting, may also be necessary to make these projects appealing for developers. The architecture portion of this project will explore feasibility through a basic real estate pro forma study. However, as this is not a real estate thesis, this component will not be relied on to determine the ultimate outcome of this proposed zone, but rather will be treated as an educational exploration into the market forces that impact housing production.

methodology overview

The location of the UR zone was determined using a GIS buffer within existing NR zones, next to existing multifamily zones. The intention is to create a transitional zone where taller buildings fit into the city's fabric and have access to mass transit, shops, and services, while also increasing densities within NR zones to allow more people to share these spaces.

The definition for the UR zone is formulated to encourage MPABs as much as possible but does not explicitly necessitate them. Seattle's code is predominantly of the modern Euclidean variety which prioritizes use-based definitions. It would be unrealistic to propose a form-based definition within this context. It would be a fascinating project to explore transitioning Seattle's code to a form-based model, but sadly, that is not this project.























Determining the appropriate regulations for the UR definition required a series of explorations. The previous survey of existing MPABs was a good starting point to assess what a typical MPAB might look like. From this, several variations of massing study were done to find desirable building configurations, which could then be reverse engineered into a set of zoning regulations.

location

The UR zone will act as a transitional buffer between NR zones and higher density zones. The map on the following page has been created to show where the UR zone might be implemented. The parcels to be rezoned are indicated in bright pink. This area represents a buffer, within existing NR zones, of .10 miles around all residential and mixed-use zones with height limits greater than 30'. Parks, ROWs, easements, cemeteries, public utilities, and other non-residential lots have been excluded. The .10 mile represents approximately 1 block, lengthwise. Other buffer distances of .15 miles and 300ft were also tested with less plausible results.

This first iteration of the proposed map has been debated among my committee, my reviewers, and myself. Initially, the logic was to create a modest, politically realistic buffer strip along all of our single family neighborhoods. This strategy would keep these higher density buildings closer to transit, stores, and amenities, while also minimizing the potential push back from some of Seattle's more stubborn

map key

 Urban Residential (UR)	 Commercial 1 (C1)
 Neighborhood Residential 3 (NR3)	 Major Institution Overlay
 Neighborhood Residential 2 (NR2)	 Midrise (MR)
 Neighborhood Residential 1 (NR1)	 Highrise (HR)
 Lowrise 3 (LR3)	 Yesler Terrace (MPC-YT)
 Lowrise 2 (LR2)	 Seattle Mixed (SM)
 Lowrise 1 (LR1)	 Downtown zones
 Neighborhood Commercial 3 (NC3)	 General Industrial 1 (IG1)
 Neighborhood Commercial 2 (NC2)	 General Industrial 2 (IG2)
 Neighborhood Commercial 1 (NC1)	 Industrial Buffer (IB)
 Commercial 2 (C2)	 Industrial Commercial (IC)

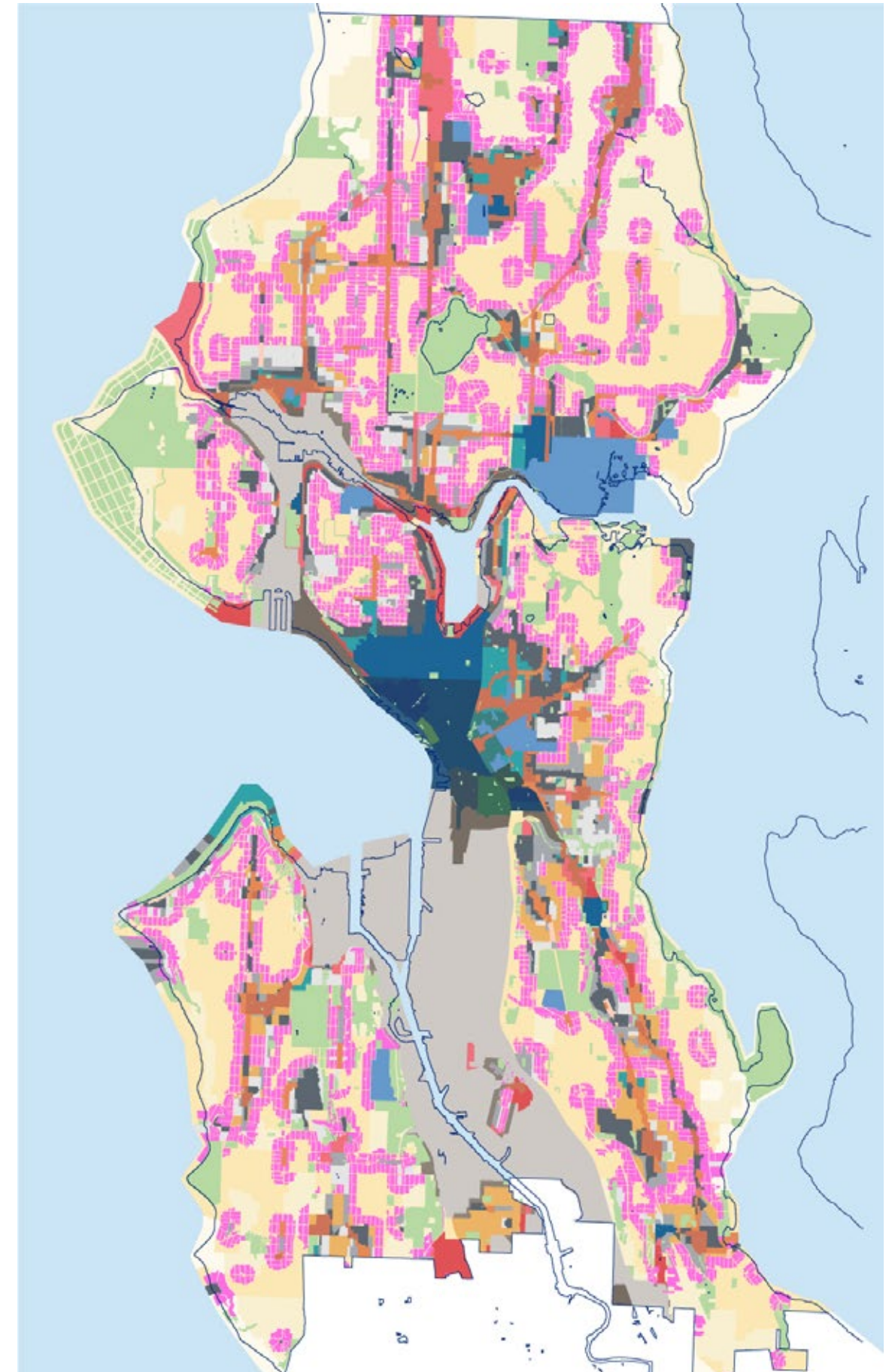


Figure 91: proposed location of Urban Residential zone shown in bright pink, overlaid on existing Seattle zoning map circa 2024.

residents. During my architectural review, several of the professionals on the panel brought up alternative methods of implementing this zone. Jeff Arango, principal at Framework, was in favor of this buffer strategy, describing some of his personal experiences with raising a family in the city. Keeping higher density housing types near transit will reduce the need for a car. Rico Quirindongo, Director of Seattle's Office of Planning and Community Development, was also in favor of this strategy and suggested using Seattle's transportation network to revise the proposed zone map.

As I describe in the conclusion to my architecture thesis, the zone could slowly expand as the city's infrastructure adapts to the increased density and demand. However, Rick Mohler, a member of my committee, architect, professor, and pro housing activist, has advocated for a wider implementation of the zone, citing a desperate need for more density, as well as Seattle's already extensive transit network. In an article from *The Urbanist*, Ryan DiRaimo pushes back on this popular strategy of focusing density along major transportation arterials. The article explains that Seattle's bus network already serves most parts of the city, including much of its single family areas. The map on the next page shows a ten minute walk shed for 10 minute (or better) service routes. DiRaimo lists a number of routes that would only require modest upgrades in order for this map to be even more extensive. Confining density to heavily trafficked corridors tends to limit housing, with new units being added to loud, polluted, potentially dangerous arterial streets. This is a terrible strategy for creating a more equitable housing supply and is unjustified by the city's mass transit network (DiRaimo 2022).

A second iteration of this map presenting a more ambitious implementation strategy would benefit from more correlation with Seattle's frequent transit service map, presented in DiRaimo's article (fig 92,95). Whether the buffer is simply expanded, or several sub-zones are implemented as described later on in this project, is still up for debate. It is clear, however, that access to transit is no longer a justifiable reason to limit this city's density. Adding density to historically single family zones will only create pressure to further improve existing transportation networks and create more economic opportunities for small businesses in these areas. Density has a number of social benefits as well, as broadly discussed in the infamous *"The Death and Life of Great American Cities"* (Jacobs 1963). As this thesis has made abundantly clear, adding middle housing capacity to Seattle's single family areas is a necessary step in the right direction towards solving the housing shortage, undoing historical injustices, and addressing our climate crisis.

lot analysis

In order to test possible massing options, a "typical" Seattle lot was needed. To determine the size and shape of the lots that might host this new zoning designation, Seattle parcel data was used to find the most common lot areas within NR zones, as seen in fig 94. While current Seattle zoning uses "Neighborhood Residential" to name its single-family zoning, the data used still refers to these areas as single-family, or SF, which is how it appears in the table. SF 5000 equates to NR3, SF 7200 to NR2, and SF

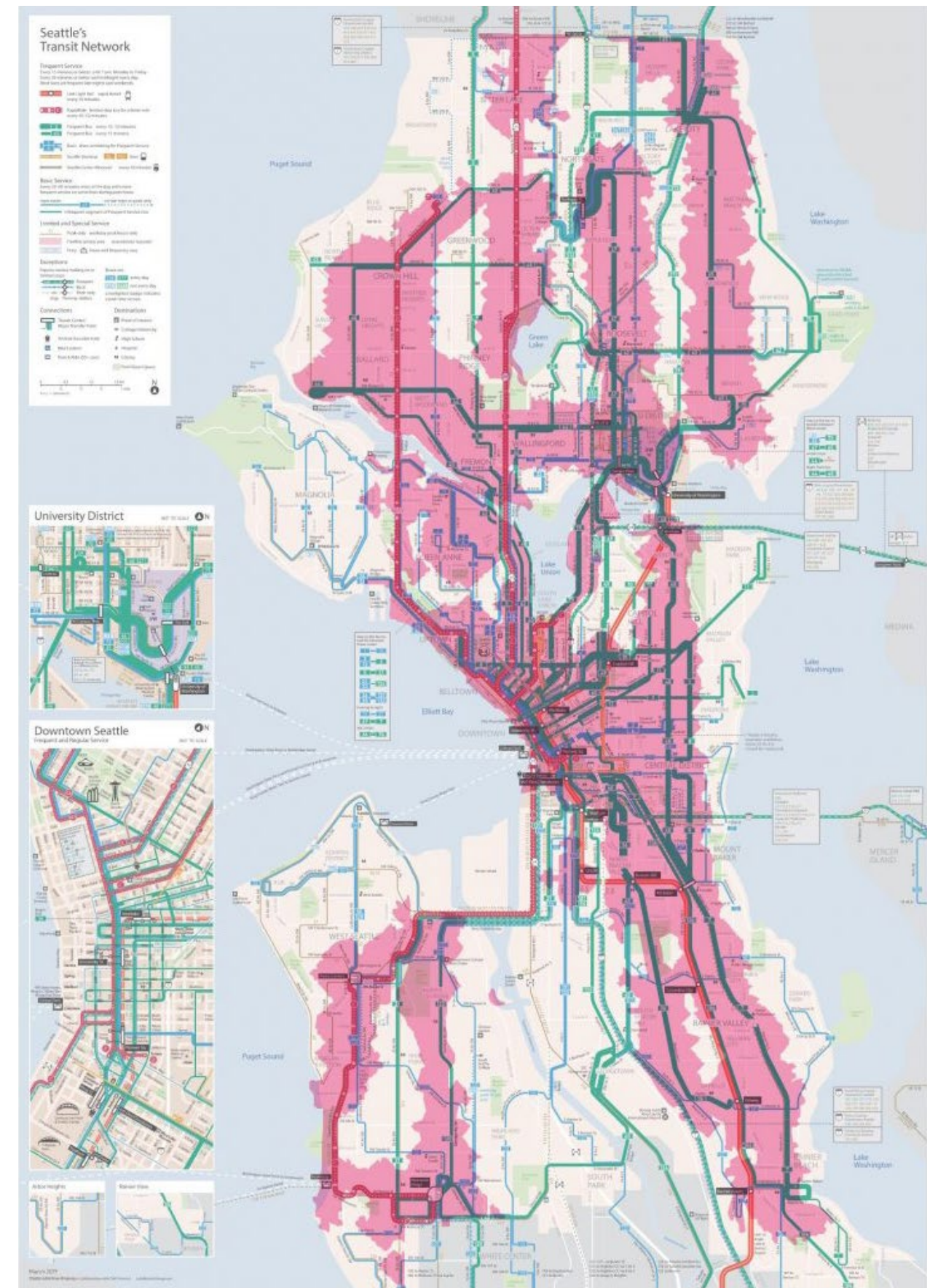


Figure 92: Seattle's frequent transit walkshed map showing areas within a 10-minute (.5 mile) walk of at least one route providing 10-minute or better all-day service (DiRaimo 2022) (Chiachiere 2018).

9600 to NR1. The designation refers to a minimum lot size theoretically required by the zone, but most lots do not tend to fall within the assumed categories. From this exploration, it was determined that lots of 4,000sf, 5,000sf, and 6,000sf could be used as reasonable case studies to test massing for the new zone.

total lots: 128,374		
sort	description	count
by area	5,000sf < X < 7,200sf	49,269
	7,200sf < X < 9,600sf	22,168
	9,600 < X	11,014
by designation	SF 5,000	99,853
	SF 7,200	25,961
	SF 9,600	2,667
both	42,743 w/ average area 5,829sf	

Figure 93: Seattle's NR lots, broken down by lot area, NR designation, and all together ("Seattle GeoData Parcels" 2020).

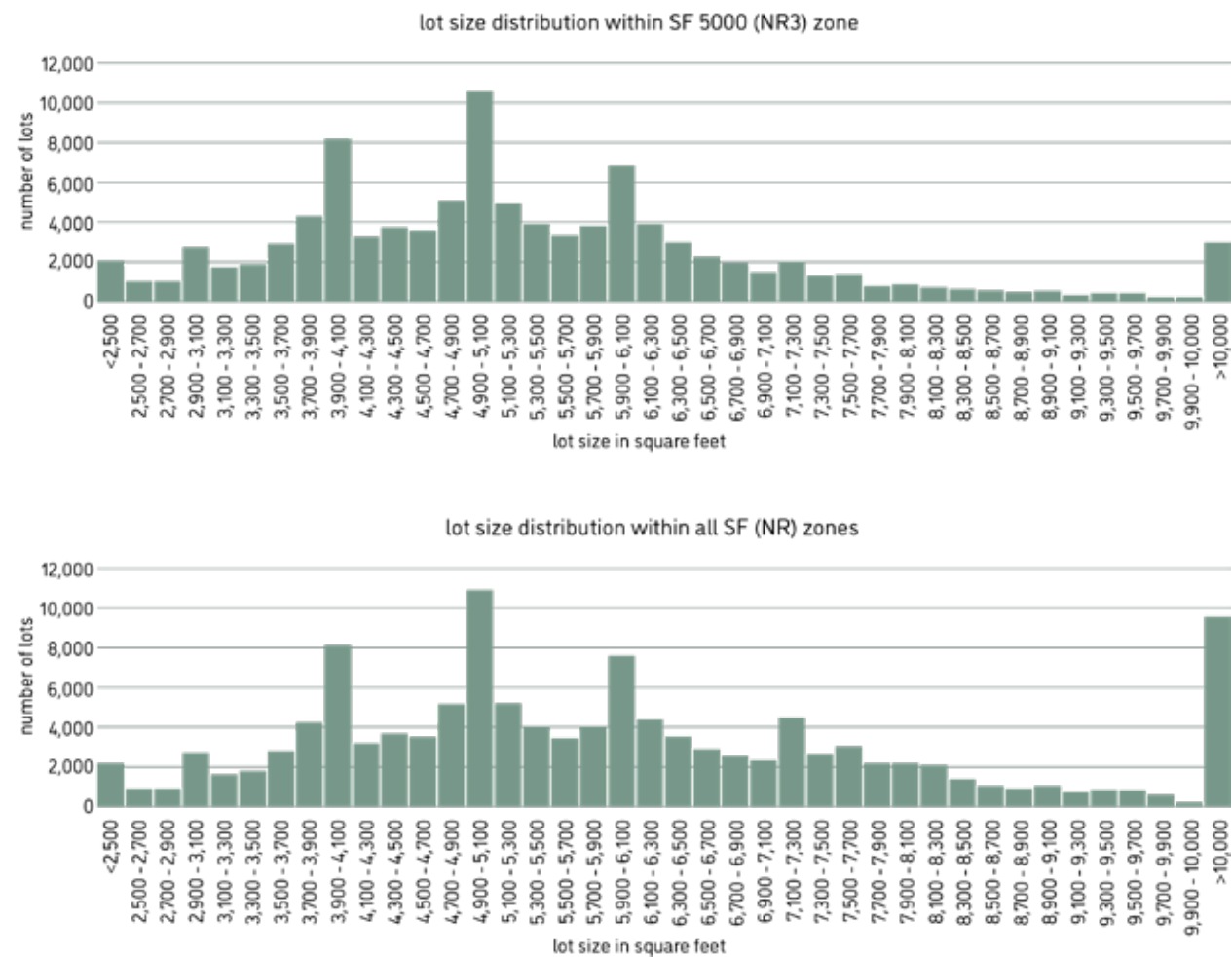


Figure 94: Seattle's NR lot size distribution showing how many lots are within each size bracket ("Seattle GeoData Parcels" 2020).

City of Seattle

Zoning

- SF 5000, SF 7200, SF 9600
 - L1, L1/RC, LDT
 - L2, L2/RC
 - L3, L3/RC
 - L4, L4/RC
 - HR, MR, MR/RC
 - SCM, SCM/R
 - NC1, NC2
 - NC3, NCR
 - C1, C2
 - DOC, DOC1, DOC2
 - DH1, DH2
 - DMC, DRC
 - DMR
 - IDM, IDR, PMM, PSM
 - IC
 - IB
 - IG2
 - IG1
 - MIO
- Zoning as of March 2001

Note: This map should be used as a general guide only and not relied upon for precise information regarding individual properties or otherwise features. Exact descriptions may be obtained by calling or visiting the Department of Construction and Land Use.

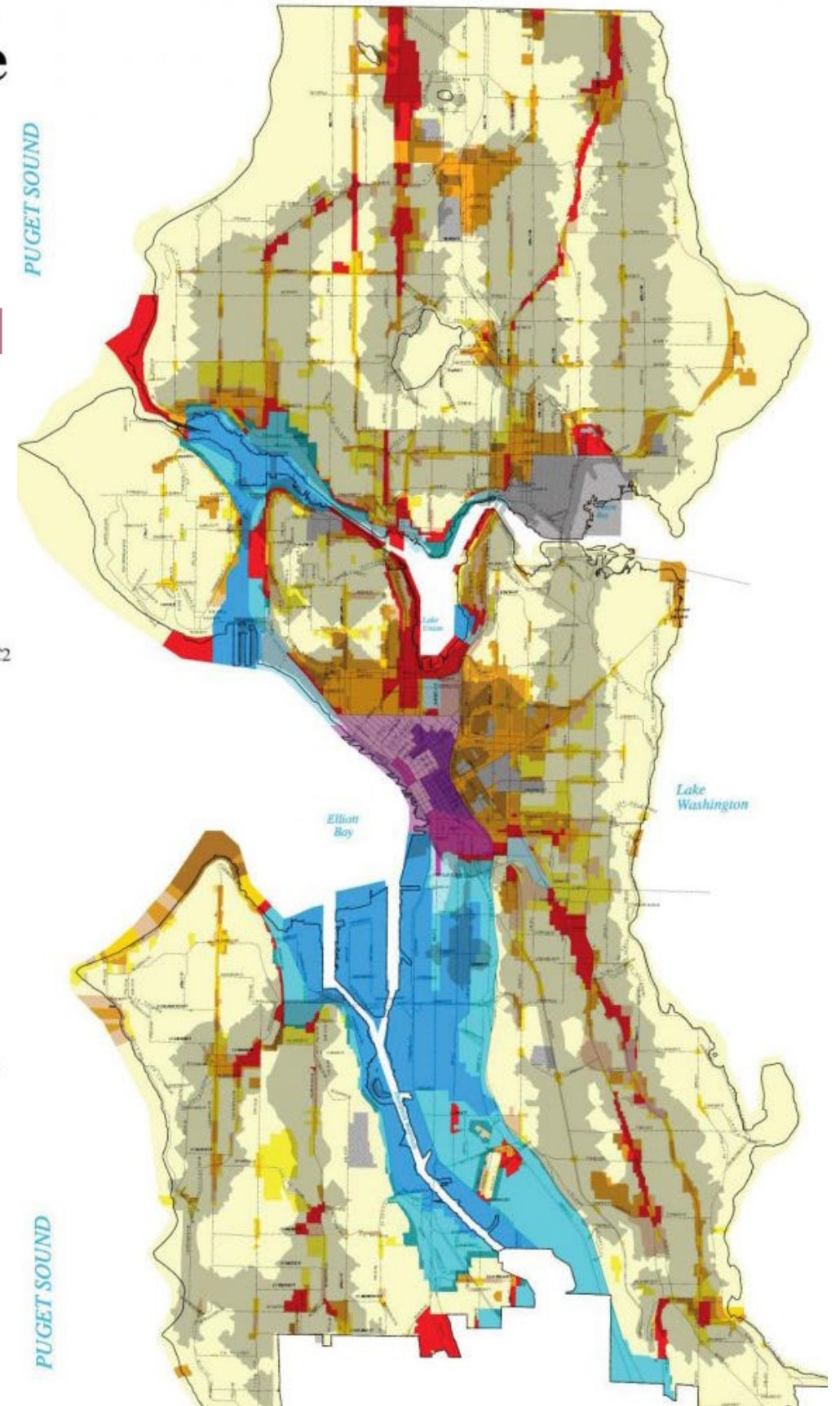
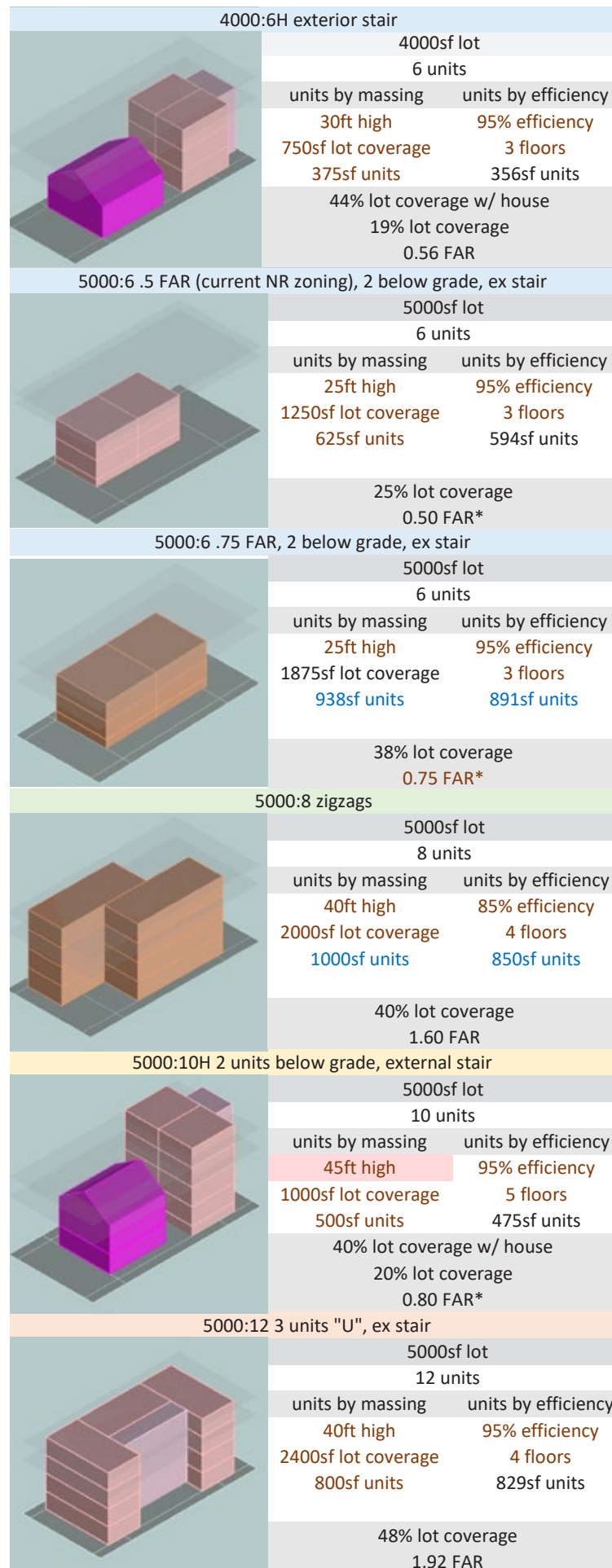


Figure 95: Seattle's zoning map, overlaid with the frequent transit walk shed map (fig 92). The lightest tan shade represent single family or Neighborhood Residential zones (DiRaimo 2022).



massing study results

Based on the lot analysis, 4000, 5000, and 6000sf lots were used for this study. For each lot, unit counts of 4, 6, 8, 10, and 12 were considered, both with and without an existing house on the lot. Some attempt was made to keep massing realistic in terms of size and configuration, while also leaving room to find "dead ends." The 4- and 6-unit scenarios were studied to assess how HB 1110 might impact the city. These massings were generally kept to .5 or .75 FAR; current NR zoning dictates .5 FAR.

Eight units on a lot generally seems to work well. This unit count pairs with existing homes, and can also be scaled up to fill a lot, typically resulting in units of 850sf, or more, that could have multiple bedrooms. Most of these buildings would reach 35 or 40 feet, which is relatively compatible with existing 30-35' single-family height limits.

A 10-unit density limit leads to similar massing, but these buildings tend to be taller, reaching 40 or 45 feet high, and would require some units to be below grade. This is the best utilization of the Seattle single-stair building code limit of 5 floors of residential, assuming the building maximizes volumetric allowances and adopts the implied two-unit per floor strategy.

Figure 96: Some of the initial massings done to explore unit counts and sizes. For the full table of 101 tests, see the appendix.

Twelve-unit density starts to sacrifice unit size for unit count. There is more variation in unit configuration, at least for conservative massing options, but these options start to feel very large in comparison to an average Seattle house.

The study indicates that eight to ten units is a reasonable density. A 40-foot base height limit feels reasonable, with an additional 5 feet added if there are units below grade, similar to how the multifamily zones are regulated. The height limit could also be variable, depending on the surrounding context, or depending on the ROW width. This would need to be further explored. Rear yard setbacks should be reduced to five or ten feet, depending on the existence of an alley. The side setbacks could remain at five feet, consistent with Neighborhood Residential zoning, but it would be beneficial to make them cumulative in order to allow better circulation along the edges of the lots, and allow for more flexibility in building design. Zero-foot setbacks would be allowed but for limited facade lengths, and in compliance with existing building code that requires non-flammable construction or ten foot spacing between structures. More extensive zero-foot side setbacks are incompatible with the existing NR fabric, and, in combination with Seattle's deep lots, are detrimental to the potential for more window walls, rendering one of the single-stair building's main assets moot.

FAR limit is dependent on other priorities including unit size and how any existing houses are treated. Full or partial floor area exemption would incentivize retention of existing homes. Retaining existing homes will reduce potential development floor area, but there are several advantages to keeping these structures that make it worth incentivize. Maybe most importantly, the building with the lowest embodied carbon impact is the one that is already built. With proper weatherization and maintenance, the single-family homes we already have can be made more operationally efficient. The materials, processes and fuel used to build them represent substantial carbon investments. Often, these structures are still very serviceable and can be made to last for many more decades. A less altruistic reason to save these existing homes is their aesthetic, place-making value. In the current social and political climate, adding density to these areas of Seattle has many home owners worried. Retaining existing homes while still adding density could help ease this transition.

With this in mind, several of the massing scenarios look at how including the house in unit count would lead to smaller buildings, or larger units, but it was decided that the existing house should also be exempt from the unit count to allow for more flexibility and financial incentive to retain existing structures. The resulting reduction in permeable lot area will need to be considered or mitigated given the effects of Seattle's increasingly more erratic rain events. Mitigation strategies could include rain water retention swales within the lot or in the sidewalk buffer strips in front of the lot.

The following diagrams summarize some of the major patterns that were observed during the initial massing study. The massing used for these diagrams is the most basic layout for the desired MPABs. More creative massing strategies could be explored, but discussion with industry professionals indicates that the most basic solution is often the most financially realistic.

The existing homes to either side in these diagrams represent a small, 1,800sf, 1.5 story, 1920s home in the foreground, and a slightly newer, slightly larger 2,700sf, 2 story home behind.

change in lot size

lot size	40x100'	4,000sf
FAR	1.4	5,600sf
coverage	35%	1,400sf
height		40'
floors		4
estimated unit size	8 units	700sf

lot size	50x100'	5,000sf
FAR	1.4	7,000sf
coverage	35%	1,750sf
height		40'
floors		4
estimated unit size	8 units	875sf

lot size	50x120'	6,000sf
FAR	1.4	8,400sf
coverage	35%	2,100sf
height		40'
floors		4
estimated unit size	8 units	1,050sf

change in unit count & lot coverage

lot size	50x100'	5,000sf
FAR	1.6	8,000sf
coverage	32%	1,600sf
height		50'
floors		5
estimated unit size	10 units	800sf

lot size	50x100'	5,000sf
FAR	1.6	8,000sf
coverage	40%	2,000sf
height		40'
floors		4
estimated unit size	8 units	1,000sf

lot size	50x100'	5,000sf
FAR	1.6	8,000sf
coverage	53%	2,666sf
height		30'
floors		3
estimated unit size	6 units	1,333sf

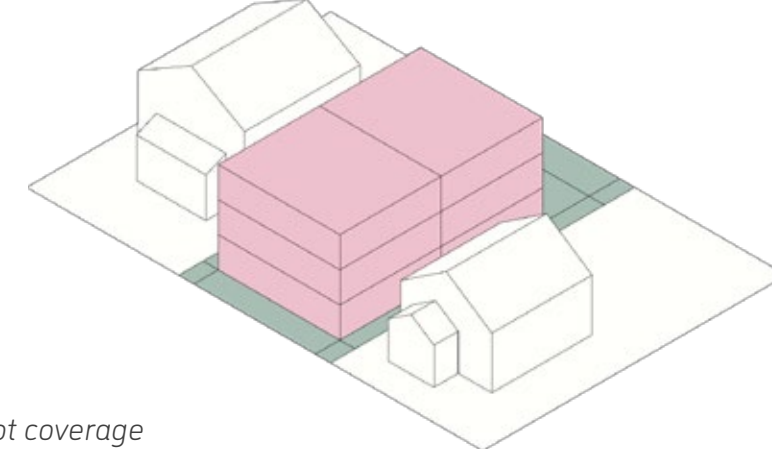
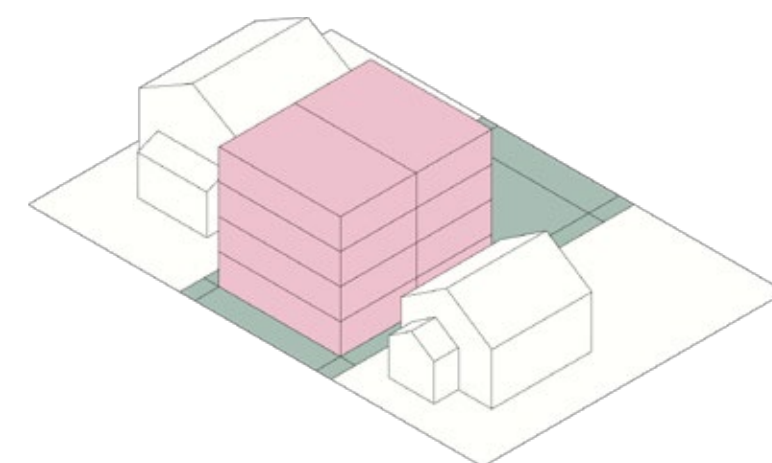
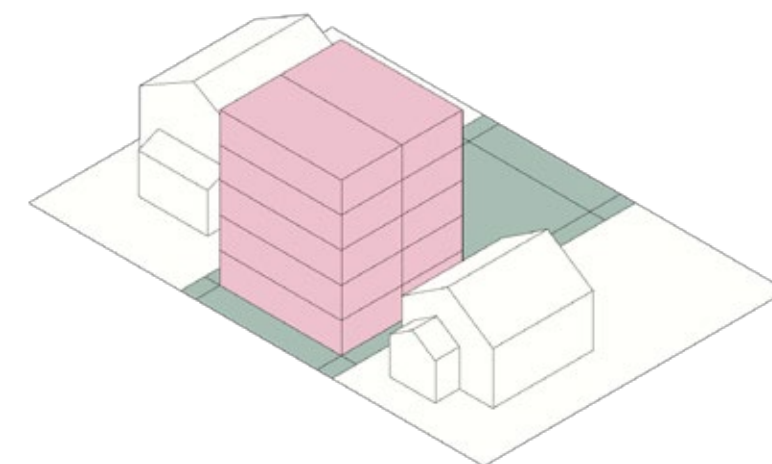
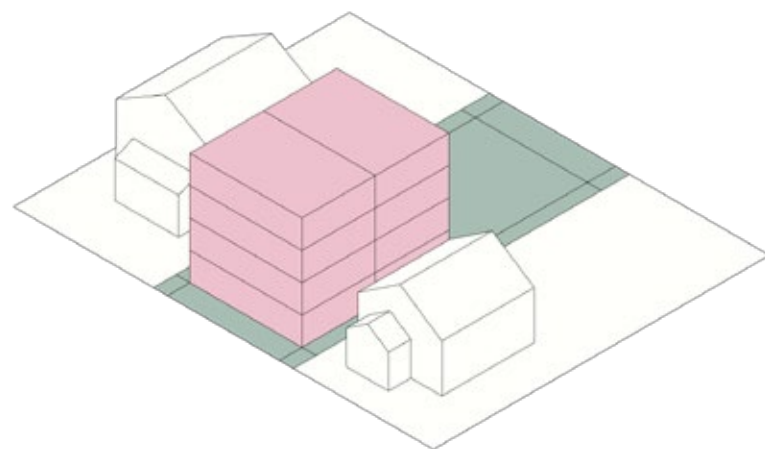
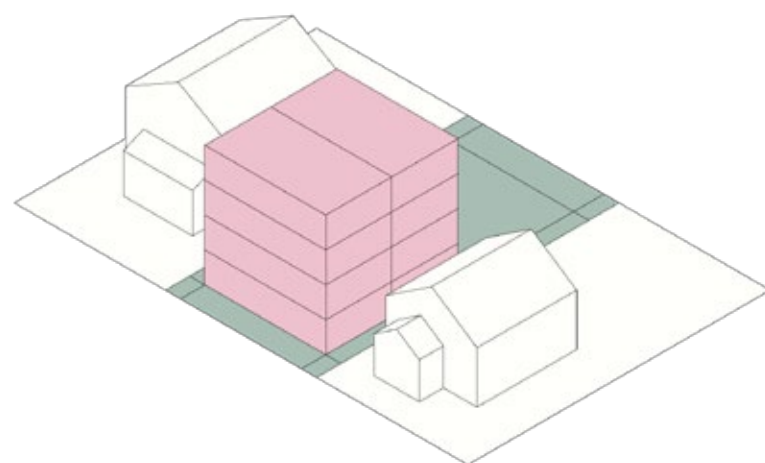
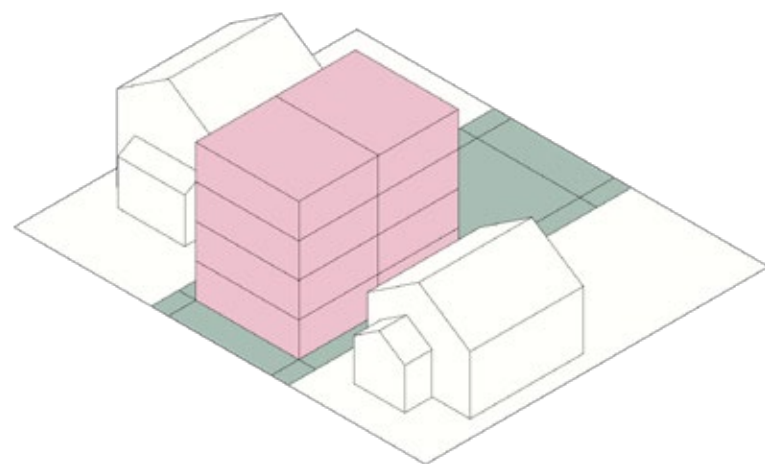


Figure 97: change in lot size

Figure 98: change in unit count & lot coverage

FAR & coverage ratios

Depending on the number of floors aloud through the height limit, total allowable square feet, when calculated through lot coverage and height, begin to match up with total allowable square feet calculated through floor area ratio (FAR). Aligning these regulations can ensure the lot is developed to the maximum intended level. An FAR that is higher than what is aloud based on height and coverage will result in lost development potential and buildings that are maximized in every possible way. An FAR that is lower than what is aloud based on height and coverage may result in more variation in massing and would promote the use of FAR bonus incentives. The important thing to note is that regulations should work together as a system.

FAR	total allowed sq ft (5,000sf lot)	sq ft per unit (8 units)	sq ft per unit (10 units)
1.4	7,000	875	700
1.6	8,000	1,000	800
1.8	9,000	1,125	900
2	10,000	1,250	1,000

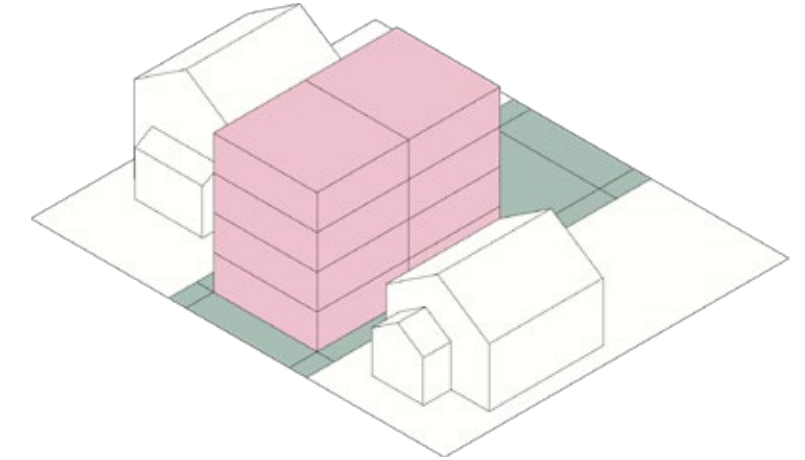
lot coverage	total allowed sq ft (5,000sf lot, 4 floors)	sq ft per unit (8 units)	sq ft per unit (10 units)
35%	7,000	875	700
40%	8,000	1,000	800
45%	9,000	1,125	900
50%	10,000	1,250	1,000

lot coverage	total allowed sq ft (5,000sf lot, 5 floors)	sq ft per unit (8 units)	sq ft per unit (10 units)
35%	8,750	1,094	875
40%	10,000	1,250	1,000
45%	11,250	1,406	1,125
50%	12,500	1,563	1,250

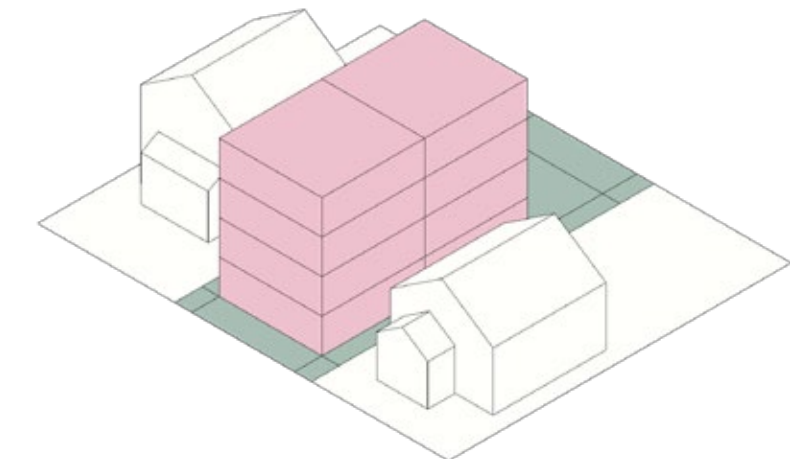
Figure 99: FAR & coverage ratios

change in FAR & coverage: 4,000sf lot, 8 units

lot size	40x100'	4,000sf
FAR	1.6	6,400sf
coverage	40%	1,600sf
height		40'
floors		4
estimated unit size	8 units	800sf



lot size	40x100'	4,000sf
FAR	1.8	7,200sf
coverage	45%	1,800sf
height		40'
floors		4
estimated unit size	8 units	900sf



lot size	40x100'	4,000sf
FAR	2.0	8,000sf
coverage	50%	2,000
height		40'
floors		4
estimated unit size	8 units	1,000sf

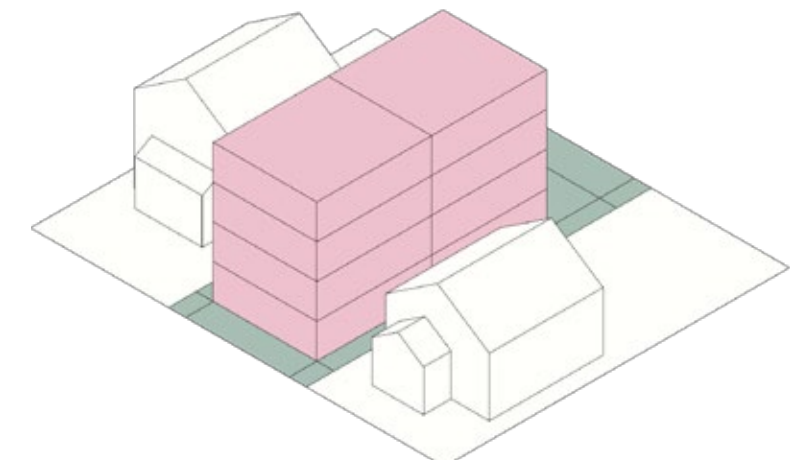


Figure 100: 4000sf, 8 units

below grade floor area

In Seattle’s multifamily zones, underground and partially below grade stories are exempt from FAR calculations. There are several other exemptions, as noted in the zoning summary chapter, but for the purposes of this project, the partially below grade area is of the most interest. Section 23.45.510.E.4 states:

“Portions of a story that extend no more than 4 feet above existing or finished grade, whichever is lower, excluding access, in the following circumstances: a. apartments in LR zones that qualify for the higher FAR limit [by meeting the requirements in section 23.45.510.C for green building performance standards, alley improvements and parking access]; b. rowhouse developments in LR zones located on lots that have a lot depth of 100 feet or less, do not have alley access, and that qualify for the higher FAR limit shown in Table A for 23.45.510, provided that parking access is located at the rear of the rowhouse development; and c. all multifamily structures in MR and HR zones.”

This would, in the correct circumstances, allow additional, partially below grade living units. This is commonly seen in many new LR midrise developments, including those studied in chapter 3 of this project, such as 519 N Bowdoin Pl, 2010 E Jansen Court, 1823 13th Ave., 8543 Midvale Ave N, and 614 13th Ave E. This idea is used in the Urban Residential zone proposal to allow additional living units without increasing height limits substantially.

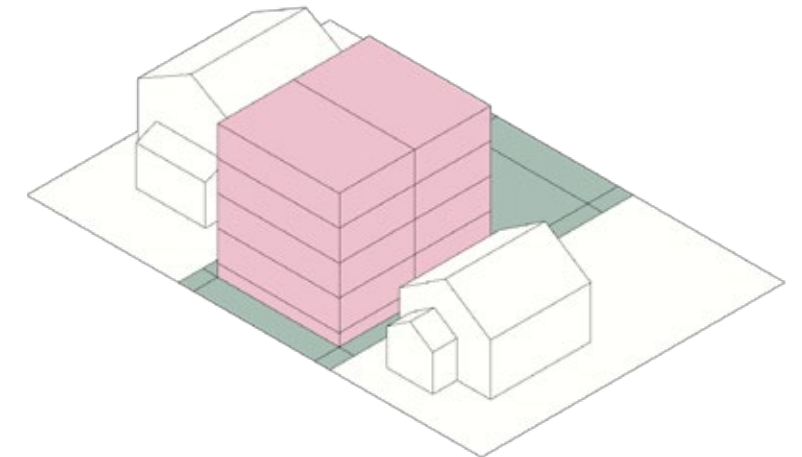


Figure 101: Partial elevation of 8543 Midvale Ave N showing partially below grade units (MUP Plan Set, 8543 Midvale Ave N 2016).

change in FAR & coverage: 5,000sf lot, 10 units

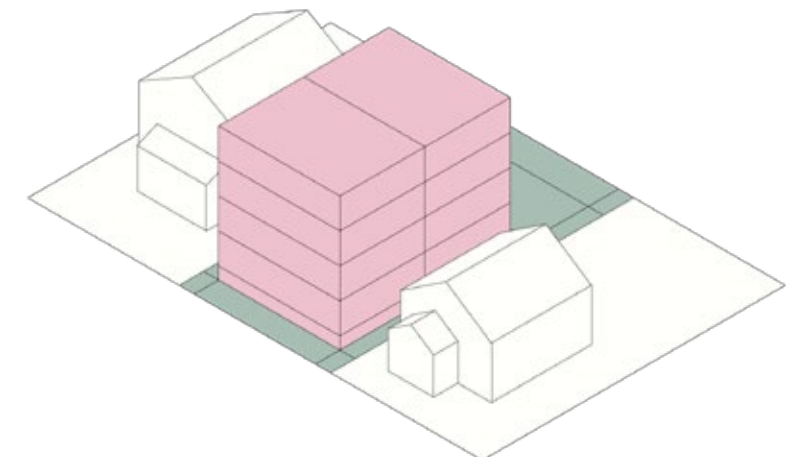
lot size	50x100'	5,000sf
FAR	1.6	8,000sf
coverage	40%	2,000sf
height		40'
floors		5*
estimated unit size	10 units*	1,000sf

*two below grade



lot size	50x100'	5,000sf
FAR	1.8	9,000sf
coverage	45%	2,250sf
height		40'
floors		5*
estimated unit size	10 units*	1,125sf

*two below grade



lot size	50x100'	5,000sf
FAR	2.0	10,000sf
coverage	50%	2,500sf
height		40'
floors		5*
estimated unit size	10 units*	1,250sf

*two below grade

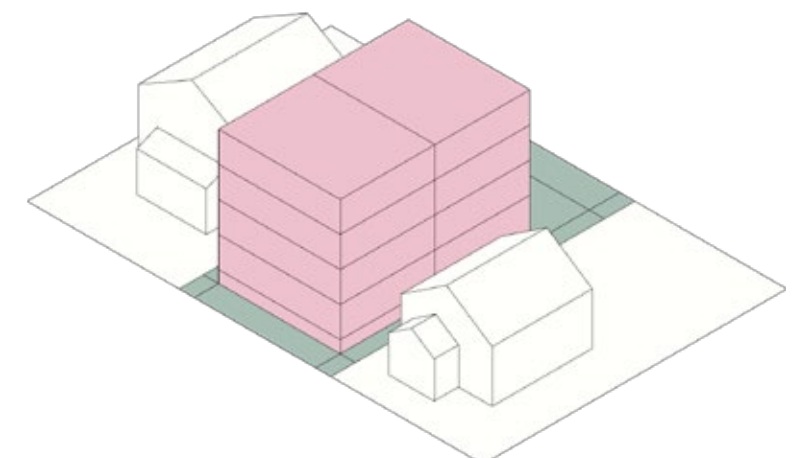


Figure 102: 5000sf, 10 units

urban residential (UR) zone description

Regulation	Description
Height Limit	40' base height. +5' if first level is partially below grade, but no more than 4' above. Parapets, elevator penthouses, and railings not included.
FAR	1.6, excluding exterior circulation up to 1,000sf, elevator shafts, partially below grade levels, and upper levels of existing single-family homes. +100sf if first or second level is set back 4' or more from street. +200sf for indoor bike parking at ground floor.
Lot Coverage	45% +5% if existing home stays. Exterior circulation up to 200sf & elevator shafts excluded.
Side Setbacks	Cumulative: 10' total. Facades within 0' to 2' setback cannot exceed 20'. Exterior circulation may extend 4' into setback, as long as the minimum distance to the lot line is 2' and the length is no greater than 20'
Front Setbacks	8' minimum. Covered porches at grade may extend into setback. Vertical circulation cannot extend into front setback.
Rear Setbacks	No Alley: 10' minimum for structure, 2' minimum for exterior circulation. Alley: 5' minimum for structure, 0' minimum for exterior circulation.
Unit Density	8 units +2 units for every 1,000sf of lot area over 4000sf Lots with an existing house are limited to an additional 8 units besides the house, regardless of lot size.
Open Space	150' of outdoor space, provided in common or split between private access. May be provided at ground level or on structure. Collective open space minimum dimension = 8'. Private open space minimum dimension = 4'. Open space must have access to fresh air and natural light.

Figure 103: UR zone description

As described in figure 102, above, FAR is contingent on lot coverage and height limit. An FAR that is lower than what the combined coverage and height allow can become unrealized space, (see MR zone in figure 87) but in this scenario, it can also lead to more flexibility in building design as there becomes a choice of where the limited floor area can go within the implied volumetric envelope created by the height and coverage limits. This relationship has been carefully considered in the final zone description, with the chosen lot coverage slightly higher than what the FAR and height would indicate. Besides contributing to general flexibility in design, this extra lot coverage promotes upper level outdoor living space, and corrects for potential floor area bonuses that will require more ground floor area.

Excluding exterior circulation space from lot coverage and FAR calculations works together with the single-stair building code requirements in subsections 7.6 and 7.7 to almost guarantee their use. This is a good example of the benefits of writing zoning codes that work with building codes to produce desired outcomes. Exterior circulation is beneficial because it is less expensive to build than the pressurized exit stairs the building code calls for, and because it can create informal outdoor spaces. Use of an exterior egress path as a gathering space is not permitted

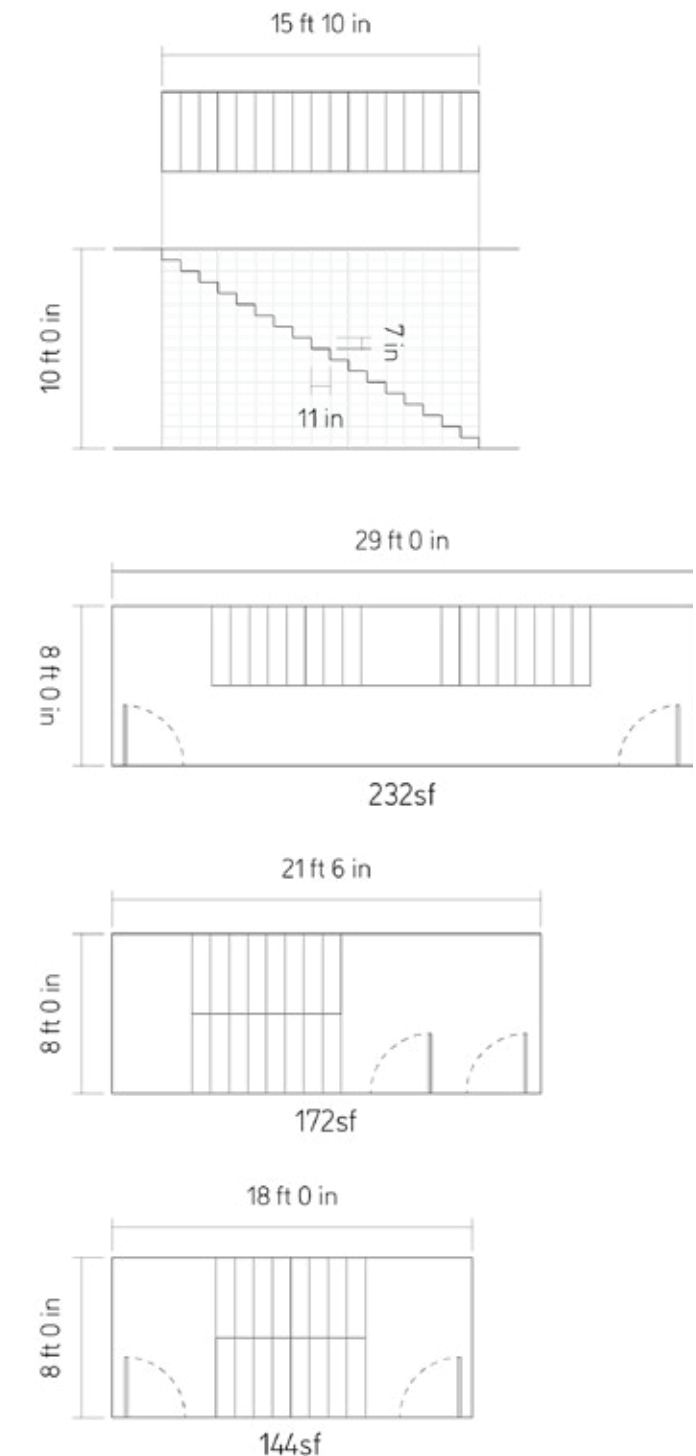


Figure 104: Diagram of possible stair layouts justifying lot coverage and FAR exemptions (200sf x 4floors = 800sf).

under the building code, but these informal uses will happen organically if given the chance. Locating the stairway outside of the building also has the benefit of reducing the perceived mass of the building and may help to reduce impermeable surface area on the lot.

Excluding the any potential elevators is intended to lessen the financial burden of installing them, and encourage more accessibility. Elevators can be expensive to install as well as maintain however, and so will not be required. Lowering barriers to more housing will require imperfect compromises but space codes can still be engineered to encourage better design when possible. As previously discussed, exempting below grade floor area and some area of existing homes has precedent in the existing code and will also promote desired outcomes.

Lot coverage and height limit work together to encourage MPABs as opposed to shorter options with more coverage like townhomes. Part of the appeal of the MPAB typology is the ability to maintain more open space and trees by building taller, thinner buildings.

Cumulative setbacks are intended, again, to create flexibility in design, allowing the architect to respond to the highly variable context within the existing NR zone. It is not uncommon to find existing single-family homes in Seattle that have near or zero side setbacks, in spite of the current requirements of the zone. A cumulative setback could be used to place the building on the lot in response to existing structures to either side, as well as create larger areas of side lot that can be used for circulation and planting. In regard to circulation, exterior stairways are aloud to encroach into setbacks so these spaces can be better used, and because of the circulation requirements proposed in the model floor plan: arranging units linearly along the lot, with the stair at the side of the building or recessed into the building, will typically provide the best units and most efficient circulation.

Front and rear setbacks are substantially less than what is currently required in NR zoning, but again, reduced setbacks are not uncommon across the city. By reducing the front and rear setbacks, longer, narrower buildings with better opportunities for natural light and cross ventilation will be possible. Smaller front setbacks can also positively contribute to the spatial character of the street, and bring life and presence closer to the sidewalk. Front porches are aloud in the front setback to further encourage action and engagement with the street.

Unit density was determined through massing studies as well as basic unit size calculations, with the goal of producing family-sized units (at least 850sf) and buildings that provide density without overpowering the existing context.

Current Seattle multifamily zones require amenity or open space to some extent. The proposed UR open space requirement is lower and more flexible than other zones, and has the potential to be ambiguous. More tests may be requires to fine tune this requirement and remove the ambiguity. As proposed, this requirement should provide either one small outdoor gathering space, at grade or on an upper level, or

private balcony spaces of approximately 4'-6" by 4' for eight units. The access to fresh air and natural light is intended to prevent dark, enclosed spaces that do not provide a real benefit for the residents. Ensuring this without creating ambiguity or excessive architectural testing may be difficult. With current modeling software, it would be reasonable and sufficient to require some basic shadow tests to pass the requirement.

This zone definition is still in a proto form that would require further testing and expansion if it were to be adopted. As a legal document, zoning code must go to extensive lengths to be cohesive, internally consistent, and loop hole free. The basic framework proposed here is enough to begin to explore designs for the dense, livable, family-sized units this project is advocating for. The architecture thesis will follow up with several of these explorations and reflect on outcomes.

Neighborhood Residential & Urban Residential summary table

zone	existing conditions			
	NR1	NR2	NR3	RSL
minimum lot size	9600sf	7200sf	5000sf	2000sf
unit density	3	3	3	2 per 2,000sf
effective max density	1 per 3,200sf	1 per 2,400sf	1 per 1,667sf	1 per 1,000sf
FAR				0.75
effective FAR for a 5,000sf lot / exclusions	.55 with 1 principal unit .75 with 1 principal + 1 ADU .95 with 1 principal + 2 ADUs			50% floor area exempt for homes built prior to 1982
effective unit size estimates for 5,000sf lot	2,750sf for principal unit			937.5sf
lot coverage	35% for lots 5,000sf or larger OR 15% +1,000sf			50%
height limit	30' + 5' for pitch roof			
front setback	lesser of: average of adjacent buildings OR 20'			10'
rear setback	lesser of: 20% of lot depth OR 25 feet			0' w/ alley OR 10' w/o alley
side setback	5'	5'	5'	5 feet
permitted setback encroachment	uncovered porches, bay windows, architectural details, and covered decks within rear setbacks, with conditions			
open space	none			
effective parking requirement	1 space per 3 units			1 per 2 units

Figure 105 Summary table of existing NR and RSL zones & proposed updates to NR zones from the comprehensive plan update, along side a summary of the proposed new zone ("Seattle, Washington - Municipal Code, Title 23 - Land Use Code" 2014) ("Updating Seattle's Neighborhood Residential Zones: A Proposal to Increase Housing Choice and Fulfill Requirements of House Bill 1110" 2024).

Figure 105 is a repetition of the previous Neighborhood Residential summary table from chapter 5, with a summary of the UR zone added for comparison. Beyond the higher unit density, the UR zone has a substantially higher FAR, slightly taller height, but less lot coverage. If the city desires to increase housing and housing options while preserving open space and trees, the UR zone would be a superior solution to the NR zone changes proposed as part of the comprehensive plan update.

proposed from comprehensive plan draft*			proposed by this project**		
4 units	6 units	affordable	lots <5,000sf	lots >=5,000sf	retaining existing home
4	6	1 per 400sf	8	8+2 for every 1,000sf	8
TBD, wording unclear		12 on 5,000sf lot	8	10 for 5,000sf	9
.5 for 1 unit ("below 1/4,000sf") .7 for 2 units ("between 1/4,000 and 1/2,200") .9 for 3-6 units ("at least 1 per 2,200sf")		1.8	1.6	1.6	1.6, excluding upper levels of existing home
2,500sf with 1 unit, 1,750sf with 2 units, 1,500sf with 3 units, 1,125sf with 4 units, 900sf with 5 units, 750sf with 6 units		750sf with 12 units	800sf for 4,000sf lot with 8 units	800sf for 5,000sf lot with 10 units	depends on footprint of existing home
50%	50%	60%	45%	45%	45% +5% if home stays
32' + 5' (3 floors)	32' + 5' (3 floors)	4 floors	40' base height. +5' if first level is partially below grade		
10'	10'	10'	8'		
0' w/ alley OR 10' w/o alley	0' w/ alley OR 10' w/o alley	NA	5' w/ alley OR 10' w/o alley. Exceptions for circulation		
5 feet	5 feet	5 feet	10' cumulatively. Façade length limits within 2'		
covered porches, bay window, and balconies			covered porches no more than 3' above grade		
20% of lot area, no less than 10' minimum dimension			150sf of outdoor area must be provided either as common space or cumulatively as private space. The area must have access to fresh air and natural light to a reasonable extent.		
market driven (none)			market driven (none)		

* information from supplemental document, "Updating Seattle's Neighborhood Residential Zones," subject to change based on public comment

** within indicated new zone areas only



7. Policy Recommendations

recommendations

In many ways, this thesis is arguing for better living units through regulations. In a city that desperately needs more affordable housing, arguing from this angle can feel frivolous, but many of the recommendations presented here are intended to achieve better housing by adjusting and reimagining our regulations in ways that would also allow more housing and a wider variety of units. By using the specific lens of family-sized housing in MPABs, more intentional and imaginative recommendations can be made.

Adjust zoning code to align with building code, construction methods, and economics.

In particular, the height limits in many of Seattle's multifamily zones do not take typical construction methods and their economic implications into account. Rather than setting heights to 30 or 40 feet in LR2 and LR3 zones, these areas should be able to maximize the limits of wood frame construction, and reach five or even six floors. The additional height would also maximize the possibilities of these projects being economically feasible. Aligning height limits with building code, and more specifically the five to six floors allowed in the single-stair code, would promote more housing as well as more MPABs.

Allowing taller buildings could justify a move to narrower buildings, which have the dual benefit of creating a higher proportion of exterior wall to interior volume, and preserving more open space. This would further promote the use of MPABs and units that have more access to light and air. Narrower buildings could be encouraged through reduced lot coverage combined with increased height and balanced FARs. Height bonuses in exchange for narrower buildings could also be used where increased to base height limits are less feasible for social and political reasons. Narrower buildings may also create more opportunities for MPABs because of an increased need for more efficient circulation plans.

The requirement for family-sized units in LR1 zones is a good idea, but is located in the wrong zone. This requirement should be relocated to a higher density zone that has the potential for these larger units to be more economically viable. As will be discussed in the architecture thesis, building larger units can make projects infeasible. More smaller units can essentially subsidize these family-sized units. This requirement should be part of the MR and possibly the LR3 zones, but not the LR1 zones where it can kill development projects and limit housing production.

Infill development could be incentivized through the use of FAR and lot coverage bonuses, or specific subsidy programs. If these programs were geared towards the use of MPABs, more of these buildings would be built. This would likely result in smaller units, but the benefits of more windows, more density, and retention of existing structures would make it worthwhile.

Improve the comprehensive plan update's capacity to produce more housing and more housing options.

As proposed, the comprehensive plan update will likely produce marginally more housing, in similar patterns to what is currently built. The city needs to take this opportunity to drastically expand potential housing production through higher unit counts and FARs and building heights in NR zones, and adjusted zoning definitions in LR and MR zones. If NR zoning was changed to something closer to the UR zone proposed in this document, the combination of unit density limits, taller buildings and increased floor area would lead to more family-sized units being built in small apartment buildings. Other zones would also benefit from adjusting, as mentioned above.

Change building codes to promote more housing production.

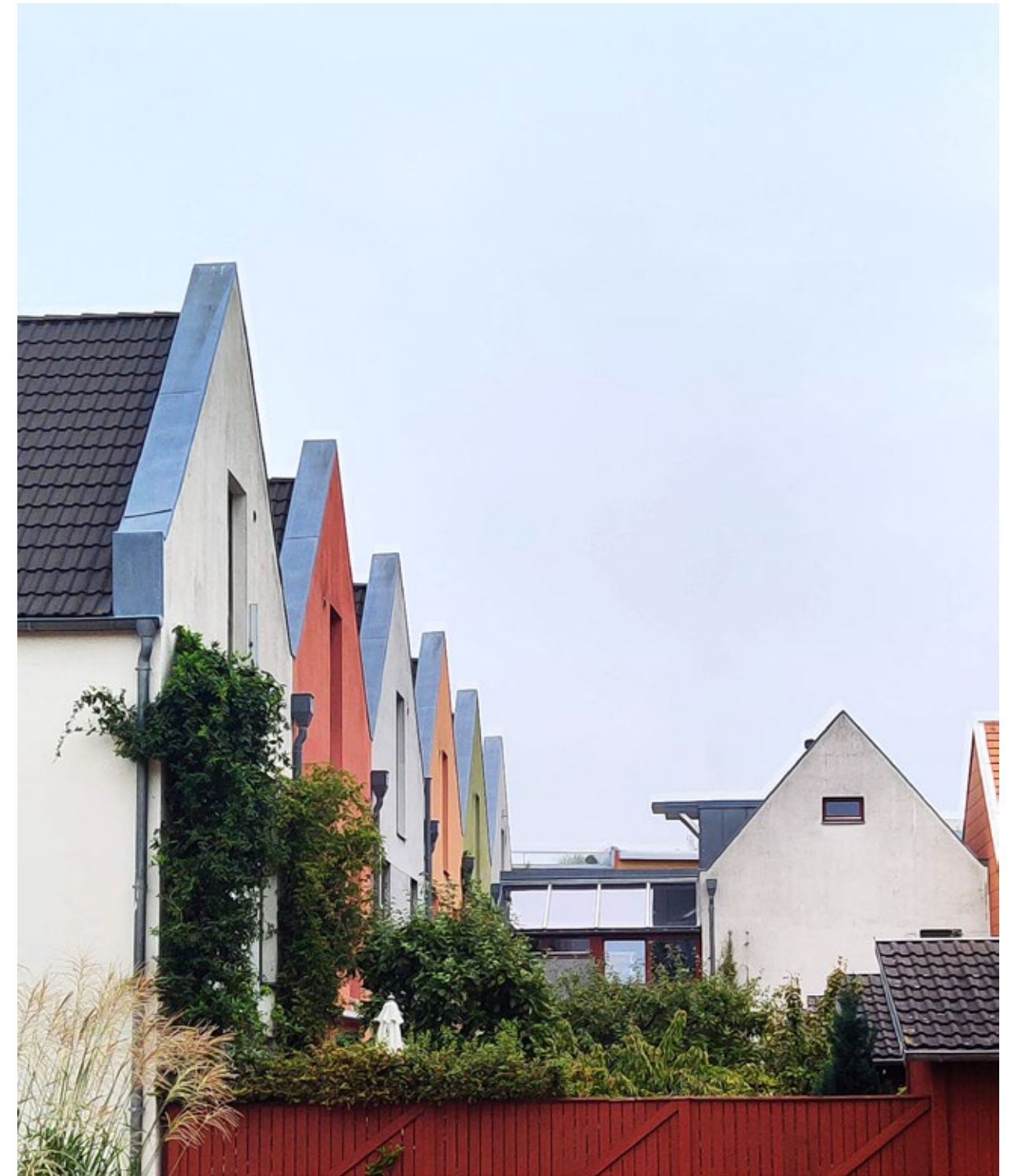
Expanding the IRC to buildings with six units has the potential to make stacked sixplexes more affordable to build, which would in turn promote their use in Seattle's updated NR zones. These buildings are excellent candidates for single-stair designs, and the egress path is not meaningfully different than that of a three story home. This would be a reasonable adjustment that could greatly improve economic feasibility for these middle housing projects.

Permitting more than two point access conditions on a single lot would massively promote point access designs, and has substantial precedent in other countries. The use of many point access conditions on a lot would allow their use in larger developments, making family-sized, multi aspect units much more feasible in common five over one construction. This, in combination with a relocated family-sized unit requirement, would be a massive step towards Seattle's goal of more family-sized units.

These recommendations are intended to expand the space available to families in Seattle, and in doing so provide a wider variety and higher quality of space. By approaching regulations with specific goals for the type of space we desire in mind, rather than only the spaces we want to avoid, we can be more intentional about who is able to live in our city. If we can center human dignity and delight, maybe we can find more creative solutions to our biggest problems.

Use architectural design studies to inform policy and code.

This project is intended, among other things, to demonstrate the benefits of using architectural design explorations to inform and improve the policy and regulations that land use planning often imposes. An informed understanding and appreciation of how buildings are designed and built will lead to better code and better buildings. Interdisciplinary strategies can lead to a better, more intentional city form.



8. Conclusion

future research opportunities

MPAB capacity study

It would be helpful to do a capacity study for MPABs similar to the one Seattle has done for ADUs. This project would require the development of spatial parameters to use in a GIS analysis of Seattle's lots. The project could compare capacity under current conditions to capacity under adoption of the UR zone proposed in this project, or focus on just one.

Developing parameters for the UR zone adoption scenario may be tricky because of the option to build new or retain existing homes. This could be looked at in several ways. Potentially the easiest way to decide between redevelopment and infill would be spatial: is there enough space on the lot to add an MPAB tower, or not? If not, redevelopment could be assumed. Alternatively, and maybe more accurately, the existing home could be assessed for quality. There is a basic classification that could fit this need in the property record data, but accessing this data at scale for the entire city may be difficult or impossible. A basic estimation of the rate of development would also be helpful in understanding the impacts of UR zone adoption, but this would likely require real estate expertise.

Basic spatial parameters would be as follows. The size of the lot would be classified in 1,000 square foot increments, starting at 4000, in order to determine potential unit counts (8 units on 4000sf, 10 units on 5000sf, 12 units on 6000sf, etc.) The zone area proposed in this project could be used, or a more refined version could be developed. Infill potential assessment would require the remaining space on a developed lot to be assessed first in terms of its spatial potential, i.e. would a building footprint fit on it, and then in terms of FAR capacity. The backyard MPAB design proposed in the architecture thesis could be used as a starting point to determine minimum required buildable dimensions. For retaining an existing home, the UR zone proposes 50% lot coverage and 1.6 FAR, excluding the upper levels of the home. Existing lot coverage and FAR would need to be calculated, then subtracted from the total possible to determine if the remaining area is substantial enough to warrant a project.

Infill potential without UR zone adoption would be confined to existing LR, MR, and other mixed use zones. This study could use a combination of slope and residual lot area to determine if MPABs could be used as infill on lots with existing structures. A similar capacity test would be needed to determine if there is enough FAR and coverage left on the site to justify an MPAB project.

Other research needs that would contribute to MPAB use and family size multifamily housing development include many of the topics covered in the recommendations above. Research is needed to investigate potential outcomes and negative impacts of IRC expansion, and allowing multiple point access conditions on a

single lot. A better understanding of the physical impacts of UR zone implementation will also be needed if this or similar zoning is to be implemented.

further testing and additional regulations

The architecture thesis that makes up the second part of this project explores several best possible outcomes within the UR regulations, but it would likely be more informative to explore worst possible outcomes and see what development based entirely on economic factors would result in. This exercise would be the first step in addressing more aesthetically based regulatory needs for the UR zone.

As is discussed at the end of the architecture thesis, The UR zone would benefit from being broken into several sub-zones or having more context-sensitive sets of requirements, for example different sets of FAR, unit count, and height limits based on lot size, rather than trying to fit this variation into a single set of regulations.

In order to get a better idea of how sub-zones or other regulations might function, it will be necessary to understand the shortcomings and undesired outcomes of the UR zone. As John Punter describes in chapter 4 of *"The Vancouver Achievement,"* once market forces take over and become the primary factor in new development, economics will begin to shape new buildings more than architectural and aesthetic considerations. Punter describes how the "Vancouver special" became the predominant new housing type as developers began to value maximizing built area over aesthetics (Punter 2003). A similar test should be done for the UR zone in which the most economically beneficial massing is explored rather than the most aesthetically pleasing or context-sensitive massing. This requires an understanding of construction methods as well as multifamily real estate economics. The former is explored to some extent in the architecture thesis, *"family-sized housing in single-stair buildings: testing the Urban Residential zone."*

This exploration should lead to a better understanding of potential undesired outcomes within the UR zone. Next, these outcomes will need to be addressed through revisions to the zone, the addition of context specific design guidelines, or some other means. Another method to increase the likelihood of desired outcomes, beyond further regulations, would be the use of pre-permitted building designs, as in the case of Seattle's ADUniverse.

These pre-permitted designs would need to be aesthetically preferable while still somewhat maximizing economic outcomes, so that developers would be incentivized to use them. These designs would not need to be the most profitable buildings in terms of lowest construction costs and highest returns. They would only need to be economically desirable enough that losses in potential profit might be made up for by the expedited permitting process. In other words, pre-permitted designs need to save the developer enough time and money to make up for any potential losses incurred through more complex design or reduced floor area.

Whether further zoning regulations, design guidelines or pre-permitted designs are used, or some combination of these, this exploration would be an excellent interdisciplinary project, requiring input and expertise from urban planning, architecture and real estate students.

urban design and the public realm

It would be beneficial to further explore the impacts of UR zoning on the public realm and urban character of Seattle. The addition of these larger multifamily buildings in formerly single-family areas will change the public realm, the environment, the street scape, tree canopy, habitat, and the over all city image. Added density will also put pressure on the city's infrastructure to adapt to shifting demands. These changes may create potential issues that should be anticipated and addressed, but will also eventually improve the overall urban fabric and lived experience of the city, creating new opportunities.

In the conclusion to the following architecture thesis, I discuss potential continuations of this project through the exploration and addition of landscaping and Green Factor requirements. This work would be complimented by a better understanding of the potential changes to the micro environment including changes in permeable surface, tree canopy, and street scape. The MPABs proposed by the UR zone have the potential to preserve more tree canopy than other low rise typologies found in Seattle's LR zones. The low lot coverage will be a primary factor. Potential loss of permeable surface may be offset by the use of bioswales. Depending on the extent of redevelopment under different scenarios, the 45% coverage in the UR zone may actually result in a higher retention of open space than the proposed 50% coverage proposed by the comprehensive plan update, but this will require further exploration to fully understand. This and similar explorations will require the interests and knowledge of landscape architecture as well as urban planning.

In the event that the UR zone is implemented, and these MPABs are built extensively, the added density and change in living space characteristics will likely put pressure on our infrastructure to better serve these areas. Most notably, our public transportation network will need to expand to account for the higher density as well as the lack of car storage facilities provided in these buildings. Shops and businesses will expand in these areas, potentially via new corner stores proposed in the comprehensive plan update, to provide basic services to people who wish to walk. The addition of backyard infill buildings, along with existing ADUs will contribute to the formation of a secondary street grid along our alleys with their own unique character. Exploring potential outcomes such as these and others would be a fascinating urban design project utilizing multiple planning and design fields.

architectural reflection

The designs produced for the architectural portion of this project gave rise to several realizations and adjustments to the proposed zone. Maybe most notably, the designs underscore that this zone is really about creating more housing diversity, not just larger units. This outcome only enforces the strengths of the proposal. Family-sized housing is one part of this larger issue of housing diversity and choice. As long as our current zoning persists, it is likely that our current housing options will also persist. Introducing a zone specifically designed to create denser middle housing options will be more successful as creating more housing diversity than making minor density adjustments to our existing Neighborhood Residential zone, or expanding our existing LR zones, as proposed by the comprehensive plan update. The following images are from two of the designs in my architecture thesis, "family-sized housing in single-stair buildings: testing the Urban Residential zone." They represent one project with a mix of units, primarily two and three bedrooms, designed for families, and a smaller project that retains an existing house. For more examples, with other unit mixes, see that thesis.



Figure 106: "a house for many families." proposes two buildings on a 4000sf lot, with the single stair between them.

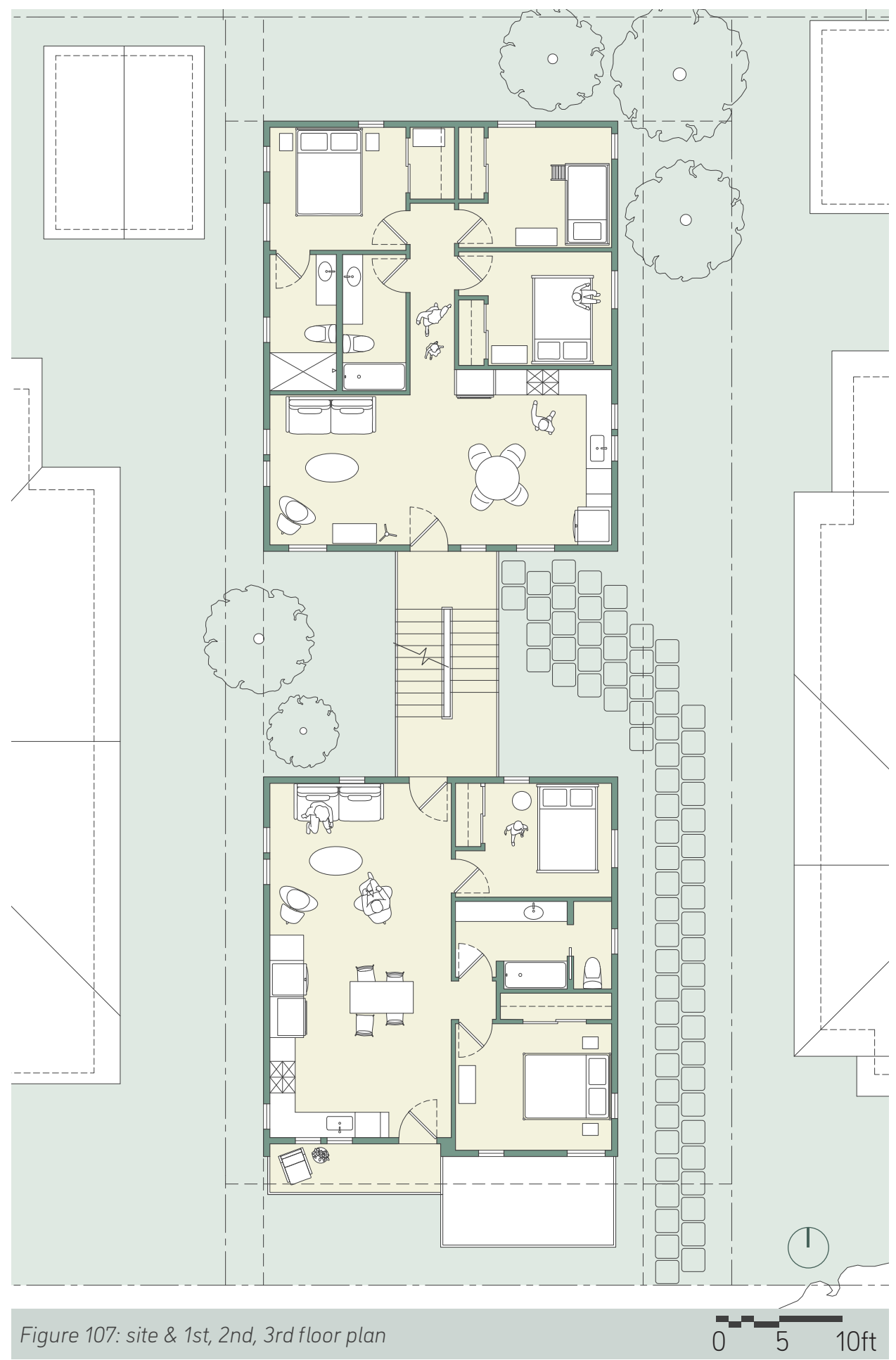


Figure 107: site & 1st, 2nd, 3rd floor plan

lot area: 4,000 sf
 allowable FAR: 6,400 sf
 built FAR: 6,280 sf
 allowable coverage: 1,800 sf
 built coverage: 1,776 sf
 height: 38' (front) / 42' (back)
 total units: 8
 unit mix: 3 3br / 3 2br / 1 1br / 1 studio

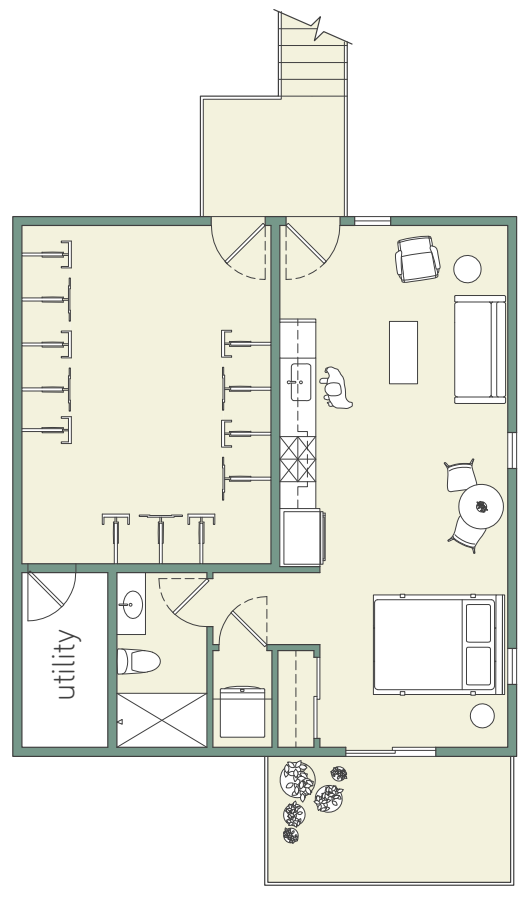


Figure 108: lower level plan (exposed basement)

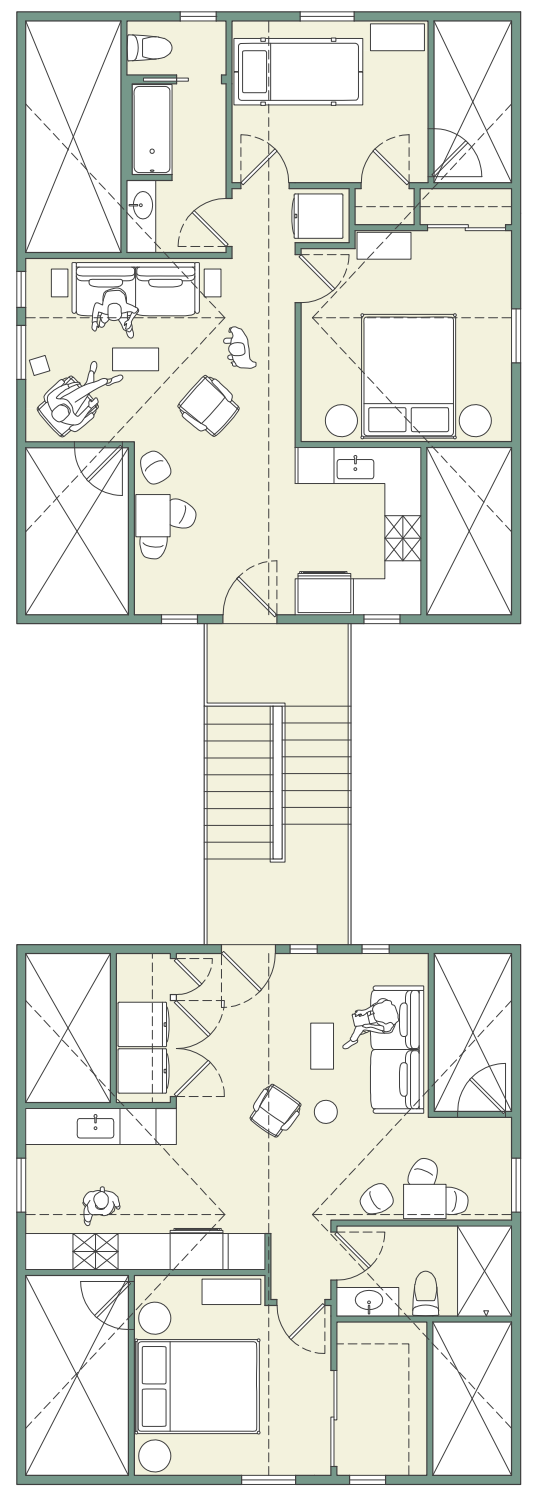


Figure 109: 3rd & 4th floor plan (gables & dormers)



Figure 110: "backyard infill" illustrates how the zone produces smaller units when the existing house is retained. The alley access makes the project successful.

lot area: 5,000 sf
 allowable FAR: 8,000 sf
 - existing home footprint: 1,400 sf = 6,500 sf
 built FAR: 3,400 sf
 allowable coverage: 2,250 sf
 + 5% for existing home: 2,500 sf
 - existing home footprint: 1,100 sf
 built coverage: 1,000 sf
 height: 41'
 total units: 8
 unit mix: 6 1br / 2 studios

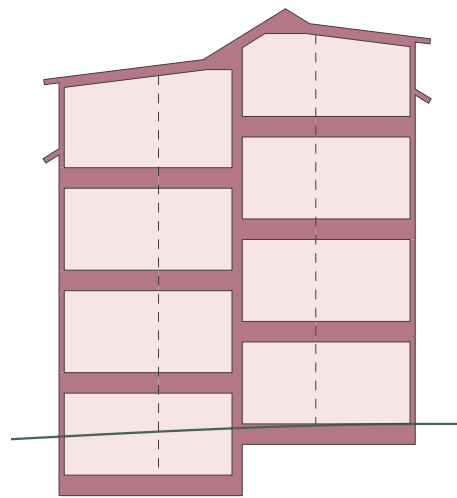


Figure 111: (below) section showing offset floors.

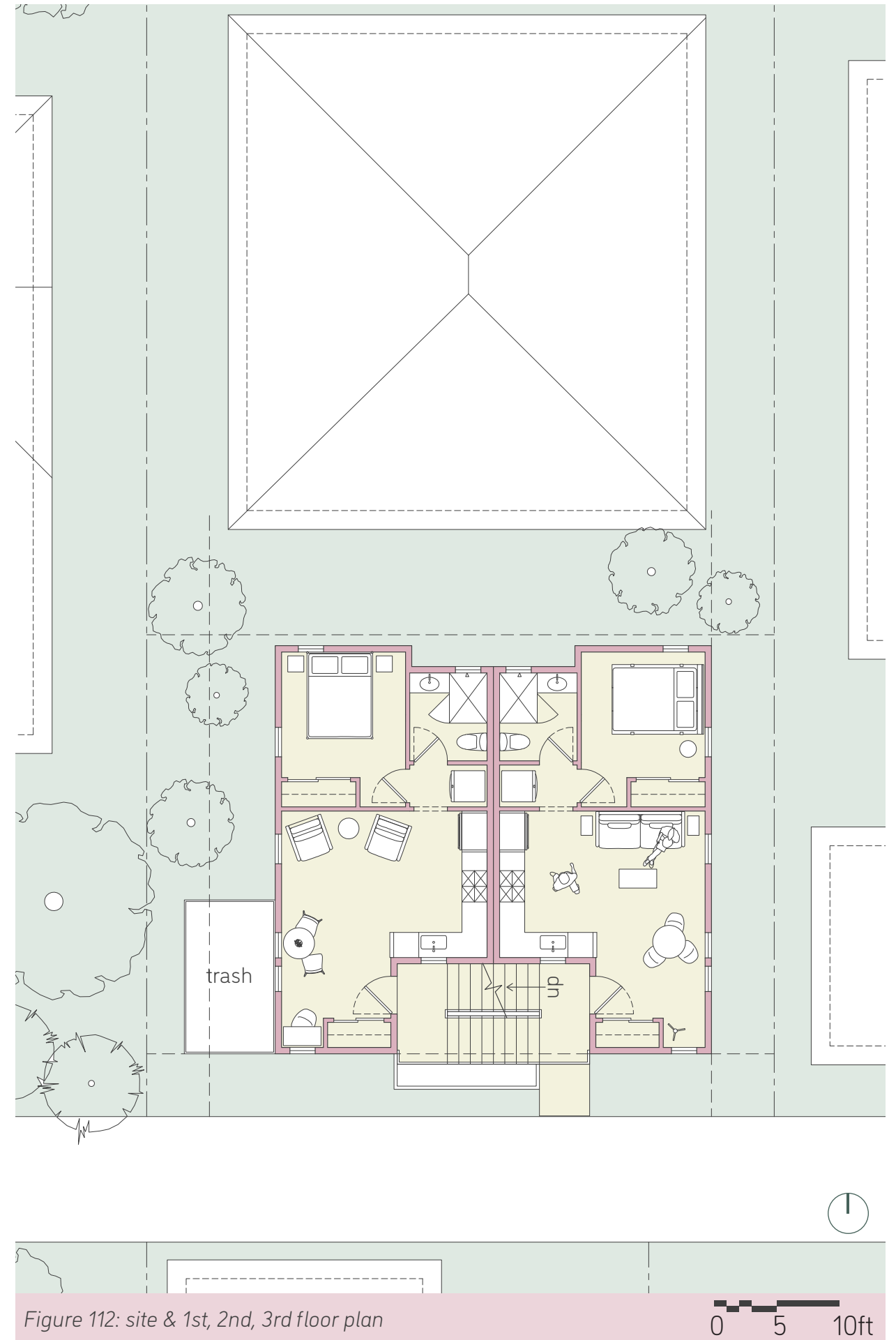


Figure 112: site & 1st, 2nd, 3rd floor plan

0 5 10ft

original Urban Residential (UR) zone description

Regulation	Description
Height Limit	40' base height. +5' if first level is partially below grade, but no more than 4' above. Parapets, elevator penthouses, and railings not included.
FAR	1.6, excluding exterior circulation up to 1,000sf, elevator shafts, partially below grade levels (no more than 4' above grade), and upper levels of existing single-family homes. +100sf if first or second level is set back 4' or more from street. +200sf for indoor bike parking at ground floor.
Lot Coverage	45% +5% if existing home stays. Exterior circulation up to 200sf excluded
Side Setbacks	Cumulative: 10' total. Facades within 0' to 2' setback cannot exceed 20'. Exterior circulation may extend 4' into setback, as long as the minimum distance to the lot line is 2' and the length is no greater than 20'.
Front Setbacks	8' minimum. Porches may extend into setback. Vertical circulation cannot extend into front setback.
Rear Setbacks	No Alley: 10' minimum for structure, 2' minimum for exterior circulation. Alley: 5' minimum for structure, 0' minimum for exterior circulation.
Unit Density	8 units +2 units for every 1,000sf of lot area over 4000sf Lots with an existing house are limited to an additional 8 units besides the house, regardless of lot size.
Open Space	150' of outdoor space, provided in common or split between private access. May be provided at ground level or on structure. Collective open space minimum dimension = 8'. Private open space minimum dimension = 4'. Open space must have access to fresh air and natural light.

Figure 113: original & revised UR zone description.

revised Urban Residential (UR) zone description

Regulation	Description
Height Limit	40' base height. +5' if first level is partially below grade, but no more than 4' above. OR +5' for the use of a pitched roof greater or equal to 6:12 for the primary roof and greater or equal to 2:12 for any shed dormers Parapets, elevator penthouses, and railings not included.
FAR	1.6, excluding exterior circulation up to 1,000sf, elevator shafts, partially below grade levels, and upper levels of existing single-family homes. +100sf if first or second level is set back 4' or more from street. +200sf for indoor bike parking at ground floor.
Lot Coverage	10% for each dwelling unit up to 45% Effective: 45% for 5 or more units +5% if existing home stays. +5% for roof top solar or on site rain water management such as bioswales Exterior circulation up to 200sf, and elevator shafts excluded
Side Setbacks	Cumulative: 10' total. Facades within 0' to 2' setback cannot exceed 20'. Exterior circulation may extend 4' into setback, as long as the minimum distance to the lot line is 2' and the length is no greater than 20'
Front Setbacks	8' minimum. Covered porches at grade may extend into setback. Vertical circulation cannot extend into front setback.
Rear Setbacks	No Alley: 10' minimum for structure, 2' minimum for exterior circulation. Alley: 5' minimum for structure, 0' minimum for exterior circulation.
Unit Density	8 units +2 units for every 1,000sf of lot area over 4000sf, up to 20 units. Lots with an existing house are limited to an additional 8 units besides the house, regardless of lot size.
Open Space	150' of outdoor space, provided in common or split between private access. May be provided at ground level or on structure. Collective open space minimum dimension = 8'. Private open space minimum dimension = 4'. Open space must have access to fresh air and natural light. No open space required for projects that retain an existing house.

These explorations lead to a number of proposed revisions to the UR zone description. Figure 113 compares both versions. For explanations of these revisions, please see the architecture thesis. The definition would still benefit from further revision though, as discussed during the architectural review.

During the architecture review, it was also made clear that the UR zone description proposed in this document would benefit from added contextual requirements or incentives. These revisions and additions would be the logical next steps for this project. For a more complete explanation of this work, please see the architecture document. In brief, the zone should be broken into multiple sub-zones with different density limits related to lot size, as well as the addition of more context-sensitive open space and landscaping requirements.

Breaking the zone into multiple sub-zones would reduce some of the complexity currently present in the definition that is needed to account for all possibilities and contexts. The use of sub-zones, or area-specific design guidelines, would also allow for a more fine-grained and contextually appropriate implementation of the zone.

Often, larger buildings can blend better with surrounding context through the use of well-designed landscaping buffers that soften and shield the form from the street. The addition of planting requirements would help these new buildings be more readily accepted into neighborhoods. The addition of rain water infrastructure requirements, primarily bioswales, will be necessary given the potential for more intense weather events driven by climate change. This infrastructure would also help to account for the reduction in permeable surface area that may occur with the addition of these buildings. These and other landscaping features, in addition to more extensive at-grade, usable open-space requirements, would improve the character and experience of the UR zone while helping to ease the transition to higher density building typologies.

While I was unable to implement these changes into the final proposal for this project, they would be an excellent opportunity to further consider the urban design implications of this proposal, and continue to advocate for added density through wider housing variety.

moving forward

Barring major changes, the comprehensive plan will be finished within the year, and its associated zoning update will be implemented over the next several years. These changes will play out over the next several decades in much the same way as the city is currently expanding. Some areas of the city will see more density, and more middle housing may be built in our NR zones. Low income families will continue to struggle to find adequate housing, while higher income families may see more opportunities at ownership of the multiplexes and cottage housing that is built in the NR zones. Generally speaking, the housing shortage will continue.

If the UR zone was adopted, or if more progressive changes are made to our existing zones, we may see more family-sized rental units built in the next several decades. In the event of its adoption, UR zoned areas would gradually become more accessible to lower-income families, reducing their commutes and car usage, while improving their access to social resources and opportunities. Ideally, a wider range of age groups, family structures, and income levels would be seen throughout all of Seattle's neighborhoods.

In the next part of this project, found in my other thesis, "*family-sized housing in single-stair buildings: testing the Urban Residential zone*," the architectural opportunities and financial feasibility of the UR zone will be explored, and a more holistic picture of the zone's outcomes will be considered. This first part of the project has demonstrated several things to me: Housing is the product of its regulatory and economic environment. Architects will design the project that best balances requirements, with their own design intentions creating a baseline rather than being the driving factor. This puts zoning and building codes in the position of creating minimum requirements that ultimately shape our living environments more than the designer is able to. As such, these codes should be treated as venues for promoting better design and desired outcomes, not just preventing negative impacts.

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10. Appendix

survey of existing MPABs table

address	permit number	year permit issued	completed	residential floors	units	family sized units (2+)	unit ratio	built height	floors from avg. grade	multi aspect: (yes=all; no=none; some=partial)
1627 14TH AVE	6830095	2023	constru	5	17	2	0.12	50'	5	yes
3320 CLAREMONT AVE	6752887	2023 ?		5	35	0	0.00	48'	4.5	yes
4011 WALLINGFORD AVE	6801181	2023	constru	4	21	0	0.00	NA	NA	mostly
1800 M L KING JR WAY	6718524	2022	constru	3.5	14	2	0.14	52'	3	mostly
200 NE 65TH ST	6755297	2022	constru	4	15	3	0.20	42'	4	yes
318 BELLEVUE AVE E	6792493	2022	no	8	20	5	0.25	73'	7.5	yes
519 N BOWDOIN PL	6678107	2022	constru	8	29	4	0.14	53'	5.5	some
1406 3RD AVE W	6722439	2021	constru	5	13	8	0.62	52'	5	yes
410 11TH AVE E	6779477	2021	yes	5	13	7	0.54	53'	5.5	yes
2514 DEXTER AVE N	6684072	2020	constru	4	8	8	1.00	43'	4	yes
519 WARD ST	6456373	2020	constru	4	8	NA		NA	NA	
1823 13TH AVE	6642790	2020	yes	5	20	0	0.00	59'	4.3	mostly
5521 15TH AVE NE	6607336	2019	yes	5	18	3	0.17	44'	4.5	mostly
8543 MIDVALE AVE N	6693040	2019	yes	5	20	0	0.00	47'	4.5	mostly
1261 S KING ST	6544424	2019	no	6.5	20	0	0.00	64'	6	mostly
614 13TH AVE E	6551761	2019	constru	5.5	20	3	0.15	51'	4.5	yes
304 10TH AVE E	6590597	2018	yes	4	8	3	0.38	43'	4	mostly
1436 NW 60TH ST	6581975	2017	yes	4	8	NA		NA	NA	
2226 NW 58TH ST	6489133	2017	yes	6	20	8	0.40	NA	NA	yes
3208 RAINIER AVE S	6443214	2017	yes	3	12	6	0.50	49'	4	no
210 W COMSTOCK ST	6354219	2016	yes	6	8	7	0.88	NA	5.5	yes
735 BROADWAY E	6473974	2016	yes	5	8	6	0.75	NA	4	yes
101 JOHN ST	6223833	2015	yes	5	20	5	0.25	66'	6	mostly
1126 N 90TH ST	6406918	2015	yes	4	8	NA		NA	NA	yes
5234 15TH AVE NE	6388563	2015	yes	4	8	1	0.13	NA	NA	yes
611 E HOWELL ST	6383919	2015	yes	5.5	20	0	0.00	64'	5	mostly
1611 S WELLER ST	6347059	2014	yes	4.5	8	NA		NA	NA	
1720 12TH AVE	6316847	2014	yes	4	9	6	0.67	48'	4.5	yes
2018 NW 57TH ST	6359455	2014	yes	6	20	7	0.35	70'	6.5	yes
2351 FRANKLIN AVE I	6369962	2014	yes	4	8	8	1.00	48'	4.5	yes
3837 EVANSTON AVE	6393617	2014	yes	4	8	0	0.00	38'	3.5	yes
3835 EVANSTON AVE	6305885	2013	yes	4	8	0	0.00	38'	3.5	yes
4221 9TH AVE NE	6388562	2014	yes	4	8	1	0.13	NA	4	yes
4219 9TH AVE NE	NA	NA	yes	4	8	1	0.13	NA	4	yes
4215 9TH AVE NE	6354898	2013	yes	4	8	1	0.13	NA	4	yes
1901 E FIR St	6680423	2019	yes	5	20	0	0.00	48'	4	some
3623 FREMONT AVE N	6528498	2016	yes	5	11	0	0.00	44'	4.5	yes
215 Boylston Ave E	NA	2014	yes	7	17	0	0.00	69'	7.5	NA
2010 E Jansen Ct	NA		yes	5	10	0	0.00	45'	4.5	mostly




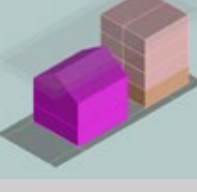
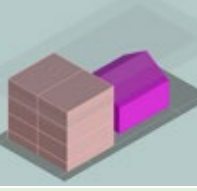

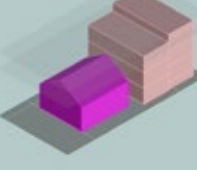

comments	zoning	odd lot condition? (L)	lot SqFt
affordable condo units, no parking, units are lofted with ladder stairs	LR3 (M) Urban	no	4,480
basement and first floor are not single stair. Three floors of single stair above. 2 single stair conditions side by side. This may not be applicable per technical definition.	LR3 (M) Hub Ur	no	8,754
full land use plan set unavailable. 2 single stair conditions on 1 lot: 4 units/2 units	NC1-40 (M) Res	no	4,560
technically 4 floors of point access. Top floor is 2 units.	LR2 (M) Hub Ur	yes? Slo	5,564
3 units per floor. Multi-aspect units	LR2 (M1) Reside	yes	5,886
some smart use or mezanines/ lofts to get more bedrooms on more floors and meet single stair code limits.	MR (M) Urban	no	4,789
a deeply complicated addition project on a steep slope with use of point access condition and lofts to meet code.	LR3 (M) Hub Ur	yes	9,600
below grade parking, 1 spot per unit	LR3 (M) Reside	yes	9,402
Habitat for Humanity project. marked as condos. Good example of more bedrooms.	LR3 (M) Urban	no	4,001
STEEP slope at back of lot, rear view. 2 large units per floor. Good example of family sized housing. Interesting that they had to resubmit a fire egress plan...	LR3 (M) Outside	yes	9,000
missing plans. Assessment based on available documents & fire permit letter	LR3 Urban Cent	no	5,160
small lot, small units	LR3 (M) Urban	no	4,200
student housing. Mostly SEDUs. Possibly the smallest window wells ever. Not sure any light gets down there. The two bedroom units might be too small to really be considered family-sized.	LR3 Urban Cent	no	4,120
Feels like one enormouse house. 5 floors including exposed basement. True point access for 3 floors only.	LR3 Residential	no	5,125
2br units are too small to be family sized. first floor and below grade floor are live work or commercial units to comply with code. Unimproved alley	DMR/C 75/75-1	no	8,937
mostly 1BR, 1 2BR per floor. b9 Architects	LR3 Urban Cent	no	6,000
a few larger units. "owners" unit takes up a good portion of the area. It's enormous. L lot. Parking behind	LR3 Urban Cent	yes	7,978
missing plans. second building on lot, appears to be Pt access from satellite imagery.	LR3 Hub Urban	yes	5,000
full plan set missing. use of mezanines to comply with code floor limits. Loft units not included as family sized.	MR-RC Hub Urb	no	5,000
only 3 floors of residential point access. Some larger units. No windows on side walls; fire walls at 0' lot lines. Parking at back of lot	SM-65vHub Ur	no	7,520
missing full plan set. stacked flats: one unit served by stair per floor. Condos. Some very in	LR1/MR Reside	yes	5,690
1-2 units per floor	LR3 Urban Cent	no	4,000
first floor is commercial. 4 units per floor. Quintessential	NC3-65 Urban	yes	14,400
no plans available, appears to be pt access, two units per floor.	LR3 Residential	no	3,290
not counting 4br as family sized units; obviously intended for room mates. 2 units per floor, each with 4 bedrooms. Living space has no windows. Weird but interesting.	LR3 Urban Cent	no	4,320
4 units per floor, studios w/ lofts	MR Urban Cent	no	3,185
based on google maps, no plans found. Building added at back of lot behind house.	LR3 RC Reside	yes	4,480
3 units per floor, unique layouts, good ventilation. COHOUSING			
https://capitolhillurbancohousing.org/	NC3-40 Urban	no	4,520
4 units per floor, 1&2 BR. mezanine lofts at 7th floor to meet code. Counting some lofts as	MR-RC Hub Urb	no	5,000
2 units per floor, 2BR. Parking below. Amazing.	LR3 Residential	no	4,950
same as 3835 Evanston. Two buildings, appear to be pt access. Assume 1 unit per floor	LR3 Hub Urban	yes?	2,400
1 of 2 buildings. 2 units per floor	LR3 Hub Urban	yes?	2,400
1 of 3 lots with same building. Same layout as 5234 15TH AVE NE. living spaces don't have windows.	LR3 Urban Cent	no	4,000
same as 4221 9TH AVE NE, different lot	LR3 Urban Cent	no	4,000
same as 4221 9TH AVE NE, different lot	LR3 Urban Cent	no	4,000
addition with fire seperation (?) five sloors including basement, single stair. Not sure why it didn't come up on the initial survey. Replaced the parking lot at the rear of the building.			
A few 2 bedroom units but they are small enough to not really count as family sized.	LR3 Residential	yes	15,360
two buildings with 1 unit per floor (except ground floor). Five floors total	LR3 Hub Urban	yes	3,357
"Capitol Core" found thru The Second Egress.	MR Urban Cent	no	2,711
back yard tower behind single family home. Found through Markus	LR3 (M)		

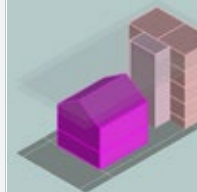
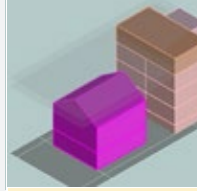
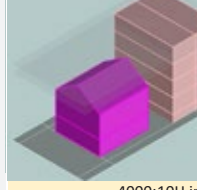
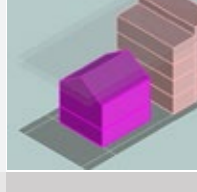
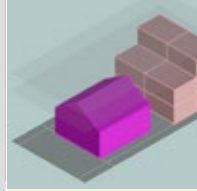
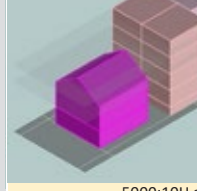
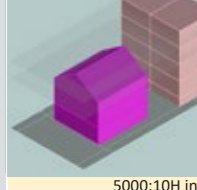
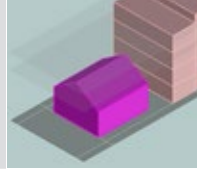
initial massing studies

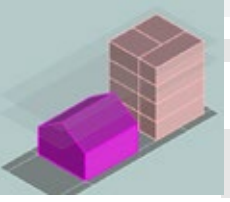


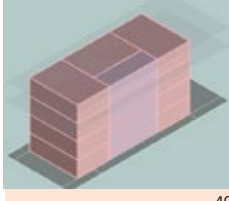

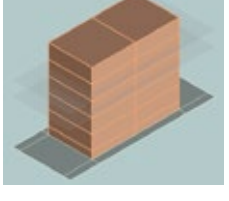
lot area	4 units w/ house			4 units w/o house		
	massing	FAR DOES NOT include house 1000sf * 2-3 floors	house =	massing		
4000	4000:4 @ .5 FAR, including house, external stair			4000:4 @ .5 FAR, external stair		
		4000sf lot 3 units*			4000sf lot 4 units	
	units by massing	units by efficiency		units by massing	units by efficiency	
	30ft high	95% efficiency		20ft high	95% efficiency	
	667sf lot coverage	3 floors		1000sf lot coverage	2 floors	
	667sf units	633sf units		500sf units	475sf units	
	17% lot coverage 0.50 FAR			25% lot coverage 0.50 FAR		
4000:4 @ .5 FAR, 1 below grade, including house			4000:4 @ .75 FAR			
	4000sf lot 3 units*			4000sf lot 4 units		
units by massing	units by efficiency		units by massing	units by efficiency		
25ft high	75% efficiency		20ft high	95% efficiency		
1000sf lot coverage	3 floors		1500sf lot coverage	2 floors		
	1000sf units	750sf units		750sf units	713sf units	
	25% lot coverage 0.50 FAR*			38% lot coverage 0.75 FAR		
4000:4 @ .75 FAR W/ HOUSE, 1 below grade, including house, ex stair						
	4000sf lot 3 units*					
units by massing	units by efficiency					
25ft high	95% efficiency					
500sf lot coverage	3 floors					
	500sf units*	475sf units				
	* house = 2000sf 13% lot coverage 0.75 FAR*					

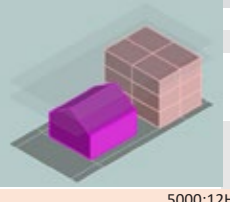
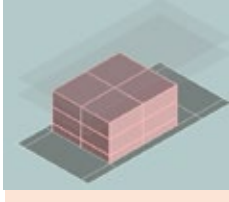
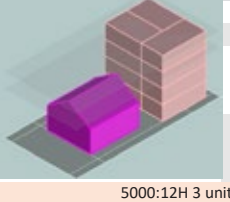
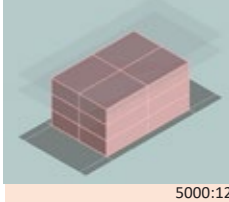
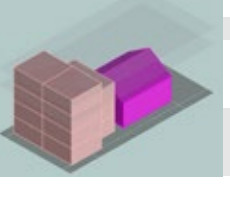
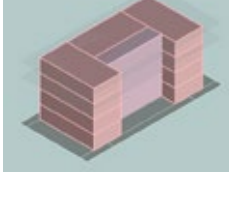
lot area	5000:4 @ .5 FAR, including house, ex stair			5000:4 @ .5 FAR, ex stair		
	massing			massing		
5000	5000:4 @ .5 FAR, including house, ex stair			5000:4 @ .5 FAR, ex stair		
		5000sf lot 3 units*			5000sf lot 4 units	
	units by massing	units by efficiency		units by massing	units by efficiency	
	30ft high	95% efficiency		20ft high	95% efficiency	
	833sf lot coverage	3 floors		1250sf lot coverage	2 floors	
	833sf units	792sf units		625sf units	594sf units	
	17% lot coverage 0.50 FAR			25% lot coverage 0.50 FAR		
5000:4 @ .5 FAR, 1 below grade, including house			5000:4 @ .5 FAR, 2 below grade (pancake)			
	5000sf lot 3 units*			5000sf lot 4 units		
units by massing	units by efficiency		units by massing	units by efficiency		
25ft high	75% efficiency		15ft high	75% efficiency		
1250sf lot coverage	3 floors		2500sf lot coverage	2 floors		
	1250sf units	938sf units		1250sf units	938sf units	
	25% lot coverage 0.50 FAR*			50% lot coverage 0.50 FAR*		
5000:4 @ .75 FAR, including house			5000:4 @ .75 FAR, rowhouses			
	5000sf lot 3 units*			5000sf lot 4 units		
units by massing	units by efficiency		units by massing	units by efficiency		
30ft high	75% efficiency		25ft high	95% efficiency		
1250sf lot coverage	3 floors		1875sf lot coverage	2 floors		
	1250sf units	938sf units		938sf units	891sf units	
	25% lot coverage 0.75 FAR			38% lot coverage 0.75 FAR		
			5000:4 @ .75 FAR, 1 below grade, external stair			
				5000sf lot 4 units		
			units by massing	units by efficiency		
			35ft high	95% efficiency		
			1250sf lot coverage	4 floors		
				1250sf units	1188sf units	
			25% lot coverage 0.75 FAR			

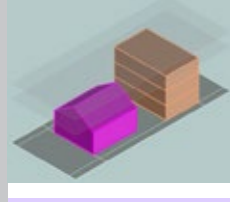
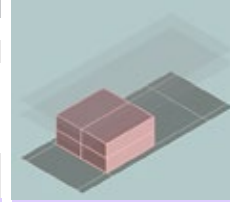
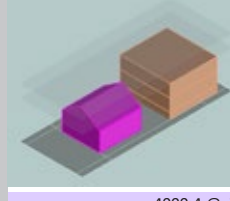
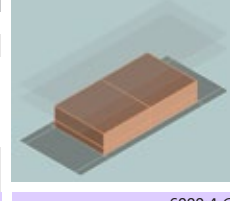
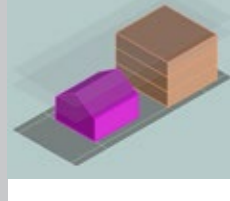
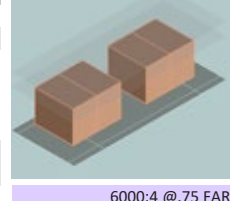
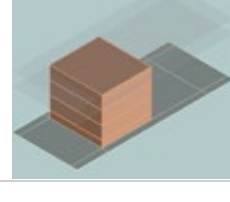
lot area	6 units w/ house			6 units w/o house		
	massing	FAR DOES NOT include house 1000sf * 2-3 floors	house =	massing		
4000	4000:6H integrated stair			4000:6 .5 FAR (current NR zoning), 2 below grade		
		4000sf lot 6 units			4000sf lot 6 units	
	units by massing	units by efficiency		units by massing	units by efficiency	
	30ft high	67% efficiency		25ft high	85% efficiency	
	750sf lot coverage	3 floors		1000sf lot coverage	3 floors	
	375sf units	251sf units		500sf units	425sf units	
	44% lot coverage w/ house 19% lot coverage 0.56 FAR			25% lot coverage 0.50 FAR*		
4000:6H exterior stair			4000:6 .75 FAR, external stair			
	4000sf lot 6 units			4000sf lot 6 units		
units by massing	units by efficiency		units by massing	units by efficiency		
30ft high	95% efficiency		30ft high	95% efficiency		
750sf lot coverage	3 floors		1000sf lot coverage	3 floors		
	375sf units	356sf units		500sf units	475sf units	
	44% lot coverage w/ house 19% lot coverage 0.56 FAR			25% lot coverage 0.75 FAR*		
4000:6 @ .75 FAR, 1 below grade, including house, ex stair			4000:6 maxed setbacks			
	4000sf lot 5 units*			4000sf lot 6 units		
units by massing	units by efficiency		units by massing	units by efficiency		
45ft high	95% efficiency		30ft high	85% efficiency		
500sf lot coverage	5 floors		1800sf lot coverage	3 floors		
	500sf units	475sf units		900sf units	765sf units	
	13% lot coverage 0.50 FAR*			45% lot coverage 1.35 FAR		
4000:6H stacked, including house			4000:6 0' lot lines			
	4000sf lot 6 units			4000sf lot 6 units		
units by massing	units by efficiency		units by massing	units by efficiency		
45ft high	75% efficiency		30ft high	95% efficiency		
840sf lot coverage	5 floors		2000sf lot coverage	3 floors		
	840sf units	630sf units		1000sf units	850sf units	
	46% lot coverage w/ house 21% lot coverage 1.05 FAR*			50% lot coverage 1.50 FAR		
5000:6 @ .5 FAR, 1 below grade, including house, external stair			5000:6 .5 FAR (current NR zoning), 2 below grade, ex stair			
	5000sf lot 5 units*			5000sf lot 6 units		
units by massing	units by efficiency		units by massing	units by efficiency		
45ft high	95% efficiency		25ft high	95% efficiency		
625sf lot coverage	5 floors		1250sf lot coverage	3 floors		
	625sf units	594sf units		625sf units	594sf units	
	13% lot coverage 0.50 FAR*			25% lot coverage 0.50 FAR*		
5000:6H 2x3, not including house			5000:6 .75 FAR, 2 below grade, ex stair			
	5000sf lot 6 units			5000sf lot 6 units		
units by massing	units by efficiency		units by massing	units by efficiency		
30ft high	75% efficiency		25ft high	95% efficiency		
1120sf lot coverage	3 floors		1875sf lot coverage	3 floors		
	560sf units	420sf units		938sf units	891sf units	
	42% lot coverage w/ house 22% lot coverage 0.67 FAR			38% lot coverage 0.75 FAR*		
			5000:6 0' side setback, towers, ex stair			
				5000sf lot 6 units		
			units by massing	units by efficiency		
			30ft high	95% efficiency		
			2000sf lot coverage	3 floors		
				1000sf units	950sf units	
			40% lot coverage 0.80 FAR*			

lot area	8 units w/ house		8 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house	massing
4000		4000:8H not including house, exterior stair 4000sf lot 8 units units by massing 40ft high 75% efficiency units by efficiency 750sf lot coverage 4 floors 375sf units 281sf units 44% lot coverage w/ house 19% lot coverage 0.75 FAR	house	4000:8 2x4 .75FAR 4000sf lot 8 units units by massing 20ft high 85% efficiency units by efficiency 1500sf lot coverage 2 floors 375sf units 319sf units 38% lot coverage 0.75 FAR
		4000:8H 1 not including house, exterior stair 4000sf lot 8 units units by massing 40ft high 95% efficiency units by efficiency 750sf lot coverage 4 floors 375sf units 356sf units 44% lot coverage w/ house 19% lot coverage 0.75 FAR	house	4000:8 towers, 2 units below grade, ex stair 4000sf lot 8 units units by massing 35ft high 95% efficiency units by efficiency 1800sf lot coverage 4 floors 900sf units 855sf units 45% lot coverage 1.35 FAR*
		4000:8H 1 not including house, 1 unit below grade 4000sf lot 8 units units by massing 40ft high 75% efficiency units by efficiency 900sf lot coverage 4 floors 450sf units 338sf units 48% lot coverage w/ house 23% lot coverage 0.79 FAR*	house	4000:8 maxed setbacks 4000sf lot 8 units units by massing 40ft high 85% efficiency units by efficiency 1800sf lot coverage 4 floors 900sf units 765sf units 45% lot coverage 1.80 FAR
		4000:8H including house, 1 larger 4000sf lot 7 units* units by massing 40ft high 75% efficiency units by efficiency 870sf lot coverage 4 floors 6@435sf, 1@870sf 373sf units 47% lot coverage w/ house 22% lot coverage 0.87 FAR	house	
5000		5000:8H Front yard, 2 units below grade 5000sf lot 8 units units by massing 35ft high 75% efficiency units by efficiency 1240sf lot coverage 4 floors 620sf units 465sf units 45% lot coverage w/ house 25% lot coverage 0.74 FAR*	house	5000:8 @ .75 FAR, 2 below grade, ex stair 5000sf lot 8 units units by massing 35ft high 95% efficiency units by efficiency 1240sf lot coverage 4 floors 625sf units 594sf units 25% lot coverage 0.75 FAR*
		5000:8H including house, 1 larger 5000sf lot 7 units* units by massing 40ft high 75% efficiency units by efficiency 1000sf lot coverage 4 floors 6@500sf, 1@1000sf 429sf units 40% lot coverage w/ house 20% lot coverage 0.80 FAR	house	5000:8 cumulative side setback, towers, ex stair 5000sf lot 8 units units by massing 40ft high 95% efficiency units by efficiency 2000sf lot coverage 4 floors 1000sf units 950sf units 40% lot coverage 1.60 FAR
		5000:8H including house, 1 unit below grade 5000sf lot 7 units* units by massing 35ft high 75% efficiency units by efficiency 1424sf lot coverage 3.5 floors 712sf units 623sf units 48% lot coverage w/ house 28% lot coverage 0.85 FAR*	house	5000:8 zigzags 5000sf lot 8 units units by massing 40ft high 85% efficiency units by efficiency 2000sf lot coverage 4 floors 1000sf units 850sf units 40% lot coverage 1.60 FAR
		5000:8 maxed setbacks 5000sf lot 8 units units by massing 40ft high 85% efficiency units by efficiency 2400sf lot coverage 4 floors 1200sf units 1020sf units 48% lot coverage 1.92 FAR	house	

lot area	10 units w/ house		10 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house	massing
4000		4000:10H exterior stair, 2 units below grade 4000sf lot 10 units units by massing 45ft high 95% efficiency units by efficiency 800sf lot coverage 5 floors 400sf units 380sf units 45% lot coverage w/ house 20% lot coverage 0.80 FAR*	house	4000:10 @ .75 FAR, 2 below grade, external stair 4000sf lot 10 units units by massing 25ft high 95% efficiency units by efficiency 1500sf lot coverage 2.5 floors 375sf units 356sf units 38% lot coverage 0.75 FAR*
		4000:10H including house, 1 larger unit, exterior stair 4000sf lot 9 units* units by massing 45ft high 95% efficiency units by efficiency 870sf lot coverage 5 floors 8@440sf, 1@880sf 459sf units 47% lot coverage w/ house 22% lot coverage 0.87 FAR*	house	4000:10 cumulative side setback, towers, 2 units below grade 4000sf lot 10 units units by massing 45ft high 95% efficiency units by efficiency 1500sf lot coverage 5 floors 750sf units 713sf units 38% lot coverage 1.50 FAR*
		4000:10H 2 units below grade 4000sf lot 10 units units by massing 45ft high 75% efficiency units by efficiency 1200sf lot coverage 5 floors 600sf units 450sf units 55% lot coverage w/ house 30% lot coverage 1.20 FAR*	house	4000:10 zigzags, 2 units below grade 4000sf lot 10 units units by massing 45ft high 85% efficiency units by efficiency 1500sf lot coverage 5 floors 750sf units 638sf units 38% lot coverage 1.50 FAR*
		4000:10H including house, 1 unit below grade 4000sf lot 9 units* units by massing 45ft high 75% efficiency units by efficiency 1200sf lot coverage 5.5 floors 600sf units 619sf units 55% lot coverage w/ house 30% lot coverage 1.20 FAR*	house	4000:10 maxed setbacks 4000sf lot 10 units units by massing 45ft high 85% efficiency units by efficiency 1800sf lot coverage 5 floors 900sf units 765sf units 45% lot coverage 1.80 FAR*
5000		5000:10H roof deck SEDUs 5000sf lot 10 units units by massing 30ft high 75% efficiency units by efficiency 1200sf lot coverage 2.5 floors 300sf units 225sf units 44% lot coverage w/ house 24% lot coverage 0.60 FAR	house	5000:10 @ .75 FAR, 2 below grade, external stair 5000sf lot 10 units units by massing 45ft high 95% efficiency units by efficiency 938sf lot coverage 5 floors 469sf units 445sf units 19% lot coverage 0.75 FAR*
		5000:10H 2 units below grade, external stair 5000sf lot 10 units units by massing 45ft high 95% efficiency units by efficiency 1000sf lot coverage 5 floors 500sf units 475sf units 40% lot coverage w/ house 20% lot coverage 0.80 FAR*	house	5000:10 cumulative side setback, towers, 2 units below grade, ex stair 5000sf lot 10 units units by massing 45ft high 95% efficiency units by efficiency 2000sf lot coverage 5 floors 1000sf units 950sf units 40% lot coverage 1.60 FAR*
		5000:10H stacked 45' tower, 2 below grade 5000sf lot 10 units units by massing 45ft high 75% efficiency units by efficiency 936sf lot coverage 5 floors 468sf units 351sf units 39% lot coverage w/ house 19% lot coverage 0.94 FAR	house	5000:10 zigzags, 2 units below grade 5000sf lot 10 units units by massing 45ft high 85% efficiency units by efficiency 2000sf lot coverage 5 floors 1000sf units 850sf units 40% lot coverage 1.60 FAR*
		5000:10H including house, 1 unit below grade 5000sf lot 9 units* units by massing 45ft high 75% efficiency units by efficiency 1200sf lot coverage 4.5 floors 600sf units 506sf units 44% lot coverage w/ house 24% lot coverage 0.96 FAR*	house	5000:10 850sf units 5000sf lot 10 units units by massing 45ft high 85% efficiency units by efficiency 2000sf lot coverage 5 floors 1000sf units 850sf units 40% lot coverage 1.60 FAR*

lot area	12 units w/ house		12 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house	massing
4000	4000:12H 3 per floor		4000:12 @ .75 FAR, 3 below grade	
	 4000sf lot 12 units units by massing 40ft high 900sf lot coverage 300sf units units by efficiency 75% efficiency 4 floors 245sf units 48% lot coverage w/ house 23% lot coverage 0.90 FAR		 4000sf lot 12 units units by massing 35ft high 1000sf lot coverage 333sf units units by efficiency 95% efficiency 4 floors 317sf units 25% lot coverage 0.75 FAR*	
	4000:12 3 unit "U", external stair		4000:12 3 unit "U", external stair	
	 4000sf lot 12 units units by massing 40ft high 1800sf lot coverage 600sf units units by efficiency 95% efficiency 4 floors 622sf units 45% lot coverage 1.80 FAR		 4000sf lot 12 units units by massing 40ft high 1800sf lot coverage 600sf units units by efficiency 95% efficiency 4 floors 622sf units 45% lot coverage 1.80 FAR	
	4000:12 too tall!		4000:12 too tall!	
	 4000sf lot 12 units units by massing 55ft high 1800sf lot coverage 900sf units units by efficiency 85% efficiency 6 floors 835sf units 45% lot coverage 2.70 FAR		 4000sf lot 12 units units by massing 55ft high 1800sf lot coverage 900sf units units by efficiency 85% efficiency 6 floors 835sf units 45% lot coverage 2.70 FAR	

lot area	5000:12H 3X4		5000:12 @ .75 FAR, 4 below grade	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house	massing
5000	5000:12H 3X4		5000:12 @ .75 FAR, 4 below grade	
	 5000sf lot 12 units units by massing 30ft high 1200sf lot coverage 300sf units units by efficiency 75% efficiency 3 floors 245sf units 44% lot coverage w/ house 24% lot coverage 0.72 FAR		 5000sf lot 12 units units by massing 25ft high 1875sf lot coverage 469sf units units by efficiency 85% efficiency 3 floors 398sf units 38% lot coverage 0.75 FAR*	
	5000:12H 3 units per floor		5000:12 3X4	
	 5000sf lot 12 units units by massing 40ft high 1200sf lot coverage 400sf units units by efficiency 75% efficiency 4 floors 327sf units 44% lot coverage w/ house 24% lot coverage 0.96 FAR		 5000sf lot 12 units units by massing 30ft high 2400sf lot coverage 600sf units units by efficiency 85% efficiency 3 floors 556sf units 48% lot coverage 1.44 FAR	
	5000:12H 3 units/floor, including house		5000:12 3 units "U", ex stair	
	 5000sf lot 11 units* units by massing 40ft high 1249sf lot coverage 416sf units units by efficiency 75% efficiency 4 floors 375sf units 45% lot coverage w/ house 25% lot coverage 1.00 FAR		 5000sf lot 12 units units by massing 40ft high 2400sf lot coverage 800sf units units by efficiency 95% efficiency 4 floors 829sf units 48% lot coverage 1.92 FAR	

lot area	4 units w/ house		4 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house =	massing
6000	4000:4 @ .5 FAR, including house, ex stair		6000:4 @ .5 FAR, ex stair	
	 6000sf lot 3 units* units by massing 30ft high 1000sf lot coverage 1000sf units units by efficiency 95% efficiency 3 floors 950sf units 17% lot coverage 0.50 FAR		 6000sf lot 4 units units by massing 20ft high 1500sf lot coverage 750sf units units by efficiency 95% efficiency 2 floors 713sf units 25% lot coverage 0.50 FAR	
	4000:4 @ .5 FAR, 1 below grade, including house		6000:4 @ .5 FAR, 2 below grade (pancake)	
	 6000sf lot 3 units* units by massing 25ft high 1500sf lot coverage 1500sf units units by efficiency 75% efficiency 3 floors 1125sf units 25% lot coverage 0.50 FAR		 6000sf lot 4 units units by massing 15ft high 3000sf lot coverage 1500sf units units by efficiency 85% efficiency 2 floors 1275sf units 50% lot coverage 0.50 FAR*	
	4000:4 @ .75 FAR, including house		6000:4 @ .75 FAR, rowhouses	
	 6000sf lot 3 units* units by massing 30ft high 1500sf lot coverage 1500sf units units by efficiency 75% efficiency 3 floors 1125sf units 25% lot coverage 0.75 FAR		 6000sf lot 4 units units by massing 25ft high 2250sf lot coverage 1125sf units units by efficiency 95% efficiency 2 floors 1069sf units 38% lot coverage 0.75 FAR	
			6000:4 @ .75 FAR, 1 below grade, external stair	
			 6000sf lot 4 units units by massing 35ft high 1500sf lot coverage 1500sf units units by efficiency 95% efficiency 4 floors 1425sf units 25% lot coverage 0.75 FAR	

lot area	6 units w/ house		6 units w/o house	
	massing	FAR DOES NOT include house 1000sf * 2-3 floors	house =	massing
6000	6000:6 .5 FAR, including the house		6000:6 .5 FAR, 2 below grade, ex stair	
	6000sf lot		6000sf lot	
	5 units*		6 units	
	units by massing	units by efficiency	units by massing	units by efficiency
	30ft high	75% efficiency	35ft high	95% efficiency
1200sf lot coverage		1125sf lot coverage		
600sf units		750sf units		
20% lot coverage		19% lot coverage		
0.50 FAR		0.50 FAR*		
6000:6 .75 FAR, including the house		6000:6 .75 FAR, 2 below grade, ex stair		
6000sf lot		6000sf lot		
5 units*		6 units		
units by massing	units by efficiency	units by massing	units by efficiency	
30ft high	75% efficiency	35ft high	95% efficiency	
1800sf lot coverage		1688sf lot coverage		
900sf units		1125sf units		
30% lot coverage		28% lot coverage		
0.75 FAR		0.75 FAR*		
6000:6H 2x3 not including house		6000:6 rowhouses		
6000sf lot		6000sf lot		
6 units		6 units		
units by massing	units by efficiency	units by massing	units by efficiency	
30ft high	75% efficiency	35ft high	95% efficiency	
1700sf lot coverage		2700sf lot coverage		
850sf units		1350sf units		
45% lot coverage w/ house		45% lot coverage		
28% lot coverage		1.35 FAR		
0.85 FAR				
6000:6H including house, minimum units				
6000sf lot				
5 units*				
units by massing	units by efficiency			
45ft high	80% efficiency			
1065sf lot coverage				
1065sf units				
34% lot coverage w/ house				
18% lot coverage				
0.71 FAR*				

lot area	8 units w/ house		8 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house =	massing
6000	6000:8H stacked SEDUS		6000:8 @ 1.0 FAR, external stair	
	6000sf lot		6000sf lot	
	8 units		8 units	
	units by massing	units by efficiency	units by massing	units by efficiency
	40ft high	85% efficiency	40ft high	95% efficiency
	748sf lot coverage		1500sf lot coverage	
	374sf units		750sf units	
	29% lot coverage w/ house		25% lot coverage	
	12% lot coverage		1.00 FAR*	
	0.50 FAR			
6000:8H front yard, 2 units below grade		6000:8 @ 1.0 FAR, 2 below grade, external stair		
6000sf lot		6000sf lot		
8 units		8 units		
units by massing	units by efficiency	units by massing	units by efficiency	
35ft high	75% efficiency	35ft high	95% efficiency	
1480sf lot coverage		2000sf lot coverage		
740sf units		1000sf units		
41% lot coverage w/ house		33% lot coverage		
25% lot coverage		1.00 FAR*		
0.74 FAR*				
6000:8H too big		6000:8 2 units below grade, 2 and 1, ex stair		
6000sf lot		6000sf lot		
8 units		8 units		
units by massing	units by efficiency	units by massing	units by efficiency	
40ft high	75% efficiency	35ft high	95% efficiency	
2268sf lot coverage		2680sf lot coverage		
1134sf units		900sf units		
54% lot coverage w/ house		45% lot coverage		
38% lot coverage		1.20 FAR		
1.13 FAR*				
6000:8 towers, ex stair				
6000sf lot				
8 units				
units by massing	units by efficiency			
40ft high	95% efficiency			
2000sf lot coverage				
1000sf units				
33% lot coverage				
1.33 FAR				

lot area	10 units w/ house		10 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house	massing
6000	6000:10H 2 units below grade, external stair		6000:10 @ 1.0 FAR, 2 below grade, ex stair	
	6000sf lot		6000sf lot	
	10 units		10 units	
	units by massing	units by efficiency	units by massing	units by efficiency
	45ft high	95% efficiency	45ft high	95% efficiency
1320sf lot coverage		1500sf lot coverage		
660sf units		750sf units		
39% lot coverage w/ house		25% lot coverage		
22% lot coverage		1.00 FAR*		
0.88 FAR*				
6000:10H ex stair		6000:10 same size as 4000:10		
6000sf lot		6000sf lot		
10 units		10 units		
units by massing	units by efficiency	units by massing	units by efficiency	
45ft high	95% efficiency	45ft high	85% efficiency	
1320sf lot coverage		1800sf lot coverage		
660sf units		900sf units		
39% lot coverage w/ house		30% lot coverage		
22% lot coverage		1.20 FAR*		
0.88 FAR*				
6000:10H 2 units below grade		6000:10 2 and 1 towers, 1 unit below grade, ex stair		
6000sf lot		6000sf lot		
10 units		10 units		
units by massing	units by efficiency	units by massing	units by efficiency	
45ft high	75% efficiency	35ft high	95% efficiency	
1600sf lot coverage		2800sf lot coverage		
800sf units		6@800sf, 4@1200sf		
43% lot coverage w/ house		47% lot coverage		
27% lot coverage		1.40 FAR		
1.07 FAR*				
6000:10H including house, 1 unit below grade		6000:10 towers, 2 below grade		
6000sf lot		6000sf lot		
9 units*		10 units		
units by massing	units by efficiency	units by massing	units by efficiency	
45ft high	75% efficiency	45ft high	95% efficiency	
1680sf lot coverage		2800sf lot coverage		
840sf units		1400sf units		
45% lot coverage w/ house		47% lot coverage		
28% lot coverage		1.87 FAR*		
1.12 FAR*				

lot area	12 units w/ house		12 units w/o house	
	massing	FAR DOES NOT include house = 1000sf * 2-3 floors	house	massing
6000	6000:12H @ .75 FAR, not including house		6000:12 @ .75 FAR, 4 below grade	
	6000sf lot		6000sf lot	
	12 units		12 units	
	units by massing	units by efficiency	units by massing	units by efficiency
	30ft high	75% efficiency	25ft high	85% efficiency
1500sf lot coverage		2250sf lot coverage		
375sf units		563sf units		
25% lot coverage		38% lot coverage		
0.75 FAR*		0.75 FAR*		
6000:12H 3X4		6000:12 staggered small		
6000sf lot		6000sf lot		
12 units		12 units		
units by massing	units by efficiency	units by massing	units by efficiency	
30ft high	75% efficiency	40ft high	85% efficiency	
1600sf lot coverage		2100sf lot coverage		
400sf units		700sf units		
43% lot coverage w/ house		35% lot coverage		
27% lot coverage		1.40 FAR		
0.80 FAR				
6000:12H 3 units per floor		6000:12 2 units per floor		
6000sf lot		6000sf lot		
12 units		12 units		
units by massing	units by efficiency	units by massing	units by efficiency	
40ft high	75% efficiency	40ft high	85% efficiency	
1600sf lot coverage		2800sf lot coverage		
533sf units		933sf units		
43% lot coverage w/ house		47% lot coverage		
27% lot coverage		1.87 FAR		
1.07 FAR				
		6000:12 staggered		
		6000sf lot		
		12 units		
		units by massing		
		units by efficiency		
		40ft high		
		85% efficiency		
		3000sf lot coverage		
		4 floors		
		1000sf units		
		927sf units		
		50% lot coverage		
		2.00 FAR		