family-sized housing in single-stair buildings: testing the Urban Residential zone

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Abstract

Family-Sized Housing in Single-Stair Buildings:
Testing the Urban Residential Zone

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This thesis builds off of work done for my Master of Urban Planning Thesis, "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." 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 architectural portion of the project, in this document, explores design strategies as well as some of the economic realities of building larger units in multifamily projects.

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acknowledgments

I would like to thank all of the many people who were patient and kind enough to help me with this project. I learned so much from all of you.

Thank you first and foremost to both of my committees for the time you have spend educating and guiding me during this process as well as the three years prior. I would like to thank Dan Abramson for chairing both committees as well as encouraging my interest in urban design. Thank you to Rick Mohler for initially convincing me to accept UW's offer and join the CBE community in 2021, teaching me the ins and outs of multifamily housing, showing me how to be an advocate for housing and good urbanism, and finally guiding me through this thesis process. I would also like to thank Gregg Colburn for explaining the fundamental economics that are perpetuating our housing shortage in his excellent book "Homelessness is a housing problem," as well as for his kindness and generosity in agreeing to help with this project. I appreciate Gregg's patience with me in my efforts to learn some small amount about real estate in entirely too little time.

I would also like to thank all of the professionals that answered my many questions for this project, especially Bradley Khouri and Alex Cohen for explaining the financial difficulties of building housing. Thank you as well to Jeff McCann for getting me started on my pro forma journey. I would also like to show my deep gratitude to Markus Johnson, not only as a professional and academic, but also as a friend, for all his time and ideas. Markus was an inspiring classmate during our time together in the MUP program, and has continued to teach me new things about planning, policy and code through his writing as well as all the direct help he gave me on this project.

Finally, I would like to thank my friends and family, for keeping me relatively sane throughout this process as well as all four years of grad school. In particular, thank you to Sal for giving me the emotional support as well as the critical feedback I needed. Finally, thank you Mom and Dad, for getting me here and getting me through.

1. Introduction

thesis introduction

This thesis builds off of the work done for my Master of Urban Planning thesis, *"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."* That project proposes the implementation of a new zone, the Urban Residential (UR) zone, as a strategy to permit and encourage larger, more diverse rental units to be built in Seattle's formerly single-family neighborhoods (Pressprich 2024). The primary motivation for this project was to explore strategies to build more housing in Seattle, through the lens of family-sized units. The city has expressed a need for more affordable family-sized housing units multiple time ("Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle" 2014) ("Draft One Seattle Plan Housing Appendix" 2024). It is also commonly known that Seattle needs more housing of all sizes ("Meeting the Challenge: Supporting Affordable Housing in the comprehensive plan" 2022). The planning thesis asked how single-stair buildings could be introduced into single-family areas, and how the size of the units in those buildings could, to some extent, be predetermined through zoning regulations. I would highly encourage anyone who is interested to review the planning thesis before reading this document. Due to outdated university policy that hinders interdisciplinary work, I was unable to combine this project into a single, cohesive document.

The Urban Residential zone, and the work done to define it, will be the baseline for these architectural explorations. This thesis will, in effect, test possible outcomes for th zone. A brief real estate analysis was also done to educate myself on the financial barriers that make infill housing difficult, and to test the feasibility of the buildings the UR zone proposes.

The architectural tests confirm that, if built, these buildings would produce a diverse mix of units, many of them with two and three bedrooms. The real estate test is somewhat inconclusive due to a lack of expertise on my part, but the process of learning the basics of residential real estate, and talking with professionals, has provided valuable insight. This research has lead me to the conclusion that, due to the larger unit sizes, these buildings would be difficult to build, especially as rental units.

It is more likely that the units produced by the UR zone would be condominiums, and that their production might be lower than desired. As condos, these units could still provide less expensive family-sized units, with the added benefit of ownership. The low production is a major downfall however. Several of the recommendations made at the end of the planning thesis focus on other strategies for building more family-sized units, including requirements in larger buildings, subsidy, and changes to building code. The process of understanding the financial difficulties of building large, affordable units has been valuable and eye opening, if at times discouraging.

In spite of these difficulties, permitting higher density multifamily buildings in areas of Seattle previously reserved for single-family homes would open the possibility of more housing production and a wider variety of people having access to more opportunities and amenities. This thesis approaches the deeply complicated and often depressing housing issue with optimism that trying something, and opening the possibility of space for a more diverse population, is better than doing nothing and perpetuating racist and classist barriers to stable housing.

research question & framework

Can denser, multifamily housing be added to Seattle's single-family neighborhoods in a way that produces a wide mix of unit sizes in buildings that compliment the surrounding context? Seattle's family-sized housing is primarily in single-family homes, which are prohibitively expensive for much of the population (Pressprich 2024). Renting, as the relatively more affordable option, can be difficult for larger families due to a lack of supply (fig 2). Missing middle housing has been presented as an answer to some of the city's housing needs, and the potential for more of these buildings is being added to single-family neighborhoods in the current comprehensive plan update. More information on this process and it's potential outcomes can be found in the planning thesis. The update proposed for Seattle's Neighborhood Residential (NR) zone would bring density up to four units for most lots, or six with proximity to transit ("Updating Seattle's Neighborhood Residential Zones: A Proposal to Increase Housing Choice and Fulfill Requirements of House Bill 1110" 2024). Unfortunately these increases are marginal and the units are limited by floor area ratio

Figure 1: example of historical middle housing apartments: 1809 41st Ave E (DiRaimo 2023).

(FAR), height and lot coverage limits. A meaningful increase in density, and the real potential of utilizing middle housing to its full potential will require more ambitious increases.

Middle housing is not a new concept. In many ways, it's implementation is a return to old ways. Across the country, in many city's, small brick apartment buildings can be found scattered through older residential neighborhoods. Minneapolis has many of these buildings, which may have contributed to it's early adoption of middle housing policies. These small apartment buildings will be a major influence for the designs in this thesis.

The focus on family-sized rental housing is covered more thoroughly in the planning thesis. In summary, Seattle's leaders have expressed a need for more two and three bedroom rental units in several documents

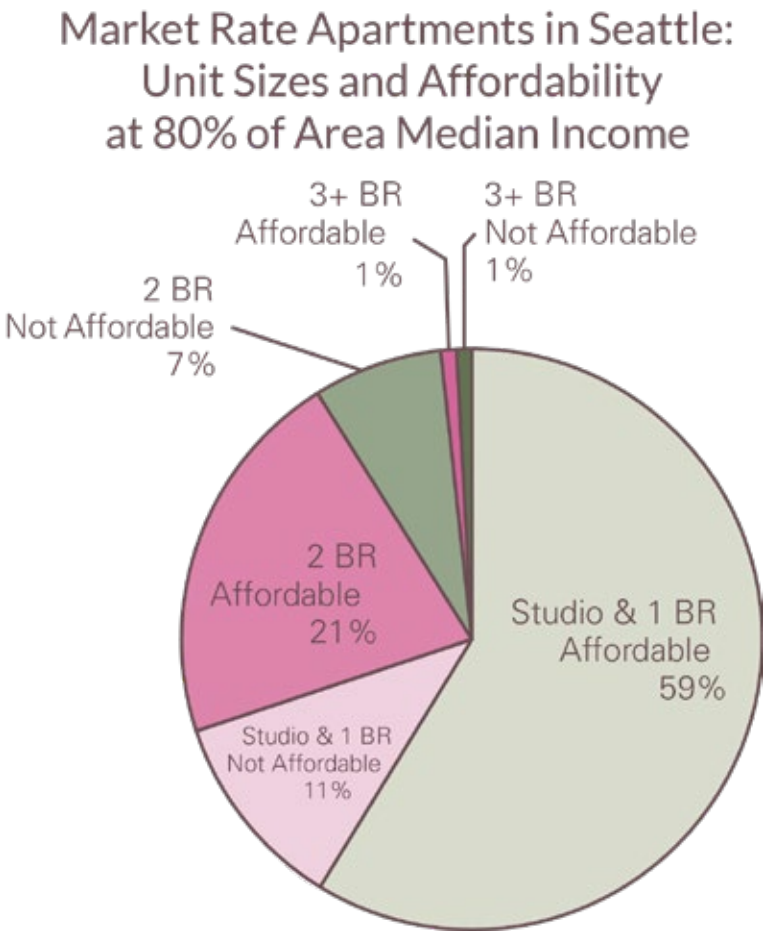


Figure 2: Market Rate Apartments in Seattle ("Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle" 2014).

Child Population Seattle and Remainder of King County Decennial Census Estimates from 1990 to 2020								
	Seattle				King County			
	1990	2000	2010	2020	1990	2000	2010	2020
Population under 18 years of age	84,930	87,827	93,513	106,841	256,141	302,819	319,989	349,364
People under 18 as a share of the population	16%	16%	15%	14%	26%	26%	24%	23%
		1990-2000	2000-2010	2010-2020		1990-2000	2000-2010	2010-2020
Change in number of people under 18		2,897	5,686	13,328		46,678	17,170	29,375
Rate of change in population under 18		3%	6%	14%		18%	6%	9%

Figure 3: Seattle's declining child population, Decennial census estimates ("Draft One Seattle Plan Housing Appendix" 2024).

including a 2014 white paper, "Family-sized Housing, An Essential Ingredient to Attract and Retain Families with Children," and again in the more recent "One Seattle Plan Draft Housing Appendix" that was released along with the draft update of the comprehensive plan.

Retaining and attracting families with children has a number of benefits. As described in the planning thesis and the 2014 white paper, creating space for families within Seattle would reduce the environmental impacts of long commutes as well as provide these families with more access to the opportunities and amenities within the city. The city is also interested in retaining and attracting a diverse, talented workforce which would be benefited by more family-sized housing.

It is difficult to determine if Seattle's low proportion of children (fig3), is due entirely to a lack of suitable housing, but it is a reasonable assumption that the lack of supply certainly isn't helping the issue. The housing appendix draft confirms that,

> ""High housing costs are one of the drivers associated with the low percentages of children in Seattle ... The relative dearth of family size units in most forms of housing besides single-family residences and the domination of studios and one-bedroom units in recent housing construction are key factors constraining the number of children in Seattle."

The draft goes on to call for middle housing as a strategy to add more diversity to the city's housing stock:

> "Seattle's housing stock is dominated by two categories of housing: increasingly expensive single-family detached dwellings and smaller rental apartments... Planning for abundant housing supply, especially ... middle housing, can help to alleviate market pressure and boost housing choices for larger households..."

As is a common trend in the draft One Seattle comprehensive plan, the text of the document is on the right track, but the actual implementation strategies do not go far enough to achieve these goals. This project proposes a more robust strategy for adding to the diversity of Seattle's hosing stock through the use of single-stair, or "point access" buildings. These buildings will be further described in the next chapter.

2. Context Overview & Previous Work

overview of previous work

This chapter will summarize the larger context explored in the preceding planning thesis as well as present that document's proposed new zone definition that will be used as a starting point for this thesis.

As this project's ultimate goal is to better understand some of the barriers to building more housing of all sorts, it was important to understand the larger context of housing in America. This includes the forms it typically takes, the regulatory environment in which it is built, some recent trends and topics of the field including middle housing, and some basic economic factors that may impact the construction of more multifamily housing. This background sets the stage for the rest of the work done for the planning thesis.

The first exploration done for the planning thesis is a survey of existing midrise point access buildings (MPABs) in Seattle, which concludes that these buildings do occasionally produce family-sized units, but more commonly tend to produce the same small studios and one bedrooms found in other recently constructed apartment buildings. This survey was helpful in learning some of the strategies used to fit MPABs into various situations, such as achieving extra height, or as infill on already developed lots.

The planning thesis then lays out existing as well as expected changes to Seattle's land use code and how MPABs fit into existing and future regulatory contexts. Several overarching trends were observed in Seattle's code. Most notably, the lack of unit density limits in multifamily zones has allowed for the current development trend of many small units.

The final portion of the planning thesis uses this background information to inform a proposal for a new zone in Seattle called Urban Residential. This zone is positioned at the edges of existing Neighborhood Residential zones with the goal of encouraging higher density development of family-sized units in these areas.

a wider context

The vast majority of all buildings in the United States are single-family homes. Single-family homes account for 75 percent of the county's housing stock and 200 billion square feet of living space. In contrast, multifamily housing accounts for only 36 billion square feet (Potter 2020). If we have any hope of meeting our climate goals and providing adequate housing for everyone, this will need to change.

Our current housing shortage has many causal factors, but a major barrier to more multifamily construction has been regulatory constraints, specifically single-family zoning (Colburn and Aldern 2022). Single-family zoning has roots in racist and discriminatory housing policy that in itself justifies an intentional shift away from this limited land use (Rothstein 2018), but single-family zoning is also exacerbating supply issues that effect everyone. 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 (Arnab Chakraborty et al. 2010).

Currently, much of the multifamily housing that is being built in urban areas is not suitable for families (Weisenthal and Alloway, 2023). The Seattle Planning Commission has identified the need for more family-sized housing. Making space for families in cities has multiple benefits: reduced costs associated with transportation, health benefits associated with active transportation modes such as walking ad biking, retention and support for a robust talent pool, improved overall economic health for the city, reduced environmental footprints associated with reduced driving and living in denser housing, and even the potential to create a more equitable city. As of 2009, 70% of Seattle's multifamily housing was studios and one bedroom units ("Family-Sized Housing: An Essential Ingredient to Attract and Retain Families with Children in Seattle" 2014). Seattle must find ways to promote more family-sized units, in higher density developments.

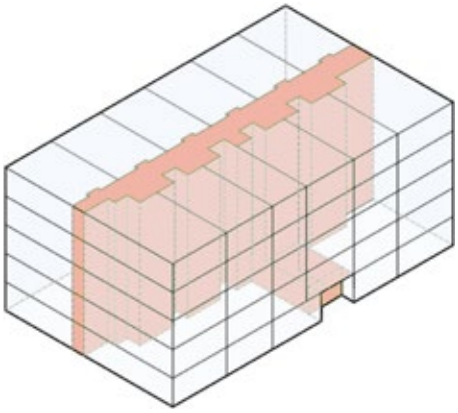


Figure 4: isometric diagram of a conventional, double loaded apartment building (Michael Eliason 2023). Common circulation highlighted in pink.

Beyond restrictive zoning, there are other factors that are limiting the construction of more family-sized housing units in our multifamily buildings. Much of the multifamily housing built in the last decade or so is in five over one type buildings. The name derives from the materials and methods used in these buildings' construction, with "five" referring to Type V construction, and "one" referring to Type I construction, as defined in the International Building Code (IBC). For a more in depth description of this building type, please refer to the planning thesis. This construction method, in combination with the IBC requirement for two means of egress in most multifamily buildings, as well as economic factors that incentivize more, smaller units, has lead to the typical six to eight story, double loaded corridor, podium buildings with parking bellow and small units above (fig 4). It is difficult to fit affordable, enjoyable family-sized units into these buildings due in large part to the low ratio of exterior wall to interior floor area that typically results in deep, single aspect units (fig 7). (Pressprich, 2024).

Fitting family-sized units into multifamily buildings is absolutely possible though. Narrower floor plates and smaller buildings can increase the exterior wall to interior floor area ratio and provide more multi aspect units (fig 6). Middle housing types can produce these more suitable floor plans. "Middle housing" is a term coined by architect and urbanist Daniel Parolek to describe the smaller multifamily building types that were more commonly built in urban areas in previous centuries. 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 ("Missing Middle Housing: Diverse Choices for Walkable Neighborhood Living," n.d.). Recent developments in land use policy has lead to these buildings being re-legalized in many cities. This project's proposal for the use of MPABs to provide more family-sized housing is a continuation of these recent conversations around legalization and use of smaller housing types, as well as the work done by architect Michael Eliason.

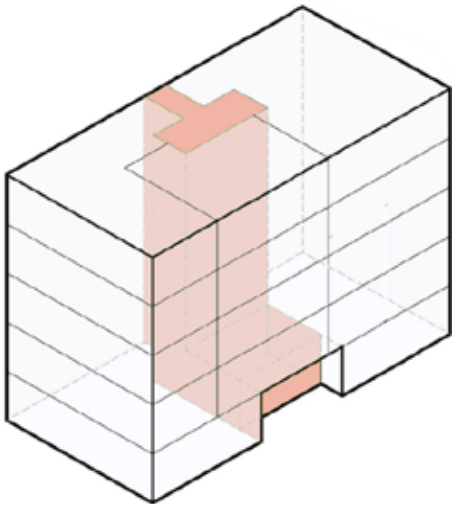


Figure 5: isometric view of MPAB massing (Michael Eliason 2023). Point access circulation highlighted in pink.

Eliason's work advocating for single-stair buildings was what initially started this project and has informed many of the assumptions that lead to their proposed use for dense, family-sized housing. Seattle's building code permits midrise single-stair buildings while the IBC, and therefore most other jurisdictions limit their use to three floors (Ching and Winkel 2021, 241). In 2023, Eliason wrote a policy brief urging other cities to adopt Seattle's legislation allowing midrise point access housing blocks (Eliason 2023). This brief summarized an earlier paper written for the city of Vancouver, BC in which Eliason argued for the implementation of policy changes that would allow for the construction of tall point access housing in that city. Eliason argues that allowing taller single-stair buildings can provide, "compact, low-carbon, and livable multifamily housing." The many benefits he cites are: increased livability provided by double aspect units, quieter bedrooms, cross ventilation,

Figure 6: double aspect apartment example ("Apartment Building Types: Building Access Arrangement" n.d.).

Figure 7: A typical single aspect, "one bedroom" apartment layout from new construction in Seattle showing a narrow, deep unit (Hemlock, n.d.).

family-sized units, and social opportunities created by inviting central stairways and more compact circulation; as well as lower embodied and operational carbon through denser development, passive cooling, and the use of wood construction (Eliason 2021) (Pressprich 2024).

Seattle's single-stair buildings

The survey of building records from the last decade that was done in the planning thesis produced 39 midrise, single-stair multifamily buildings. Compared to permits for other multifamily projects during the same time, this is not very many. Some of these projects have family-sized units but many do not. The buildings fill entire lots or share with existing buildings. A fair number of them are condos. Generally speaking, this study concludes that MPABs do not, as a rule, produce multi aspect family-sized units, but that they do have the potential to do so under the right circumstances.

The other, two stair, midrise multifamily projects that were observed over the course of the survey tended to have more, smaller units, so much so that it became apparent that unit counts must be a major driving factor for typical market rate multifamily projects. Often a second stair is added to a project to allow more units on each floor. This is a major limitation of the single-stair building code.

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. (2018 Seattle Building Code - 1006.3.3.7). A full description of this section of the code is laid out on the following page. Many of the project observed were able to achieve more than five floors of residential through the use of multi story units. MPABs taller than five floors were not uncommon. Several projects even reached 70 feet in height. The limitation on units per floor is much more difficult to overcome without adding a second stair.

These observations lead to another important question: Is building family-sized units through the use of MPABs financially feasible? This thesis will attempt to understand some of the economic factors that impact the feasibility of these projects and drive the characteristics of many of the multifamily projects that are currently being built.

Seattle's single-stair building code

2018 SBC Chapter 10, Section 1006.3.3.7:	Interpretation:
Not more than 5 stories of Group R-2 occupancy are permitted to be served by a single exit under the following conditions:	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.

survey of existing MPABs

The following is a selection of the projects covered by the planning thesis. Please refer to that document for more details and other projects.

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 8: image of 2514 Dexter Ave N under construction in spring of 2023.

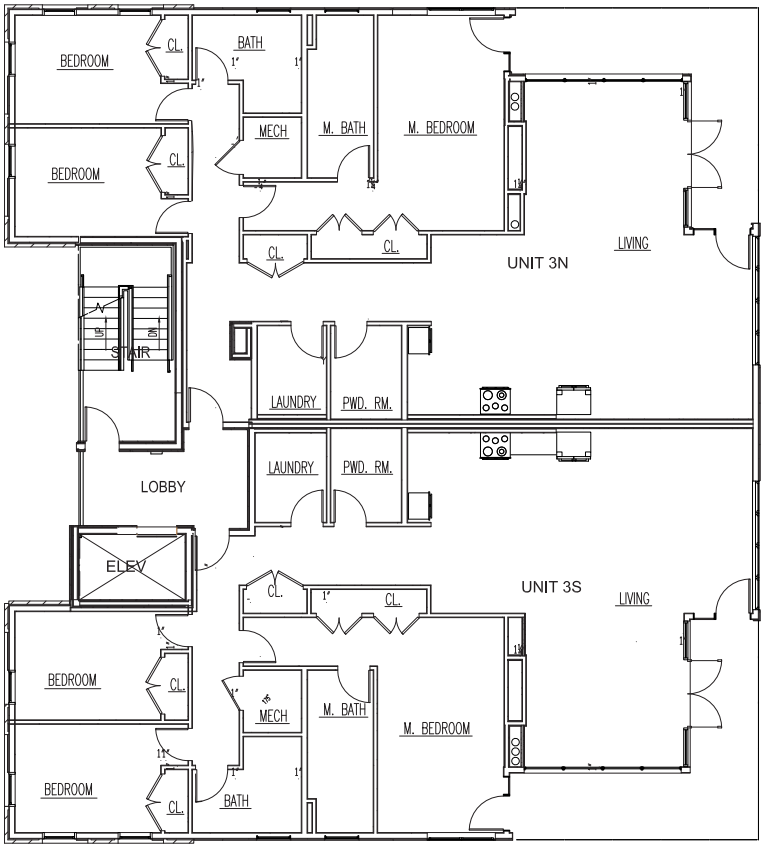


Figure 9: typical floor plan for 2514 Dexter Ave N ("Plan Review No. 77554, Automatic Sprinkler System, 2514 Dexter Avenue North - Dexter Avenue Condominiums" 2021).

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 10: images of 1823 13th Ave, taken from B9 Architects' website ("Seattle Apartment Design and Architecture: 13th Avenue Apartments," n.d.).

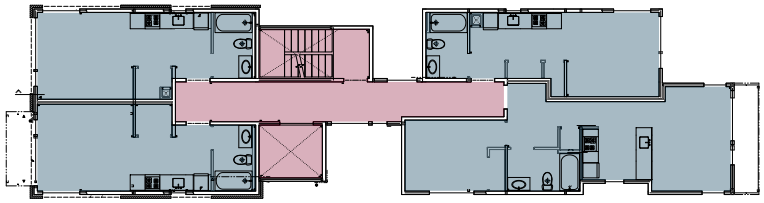
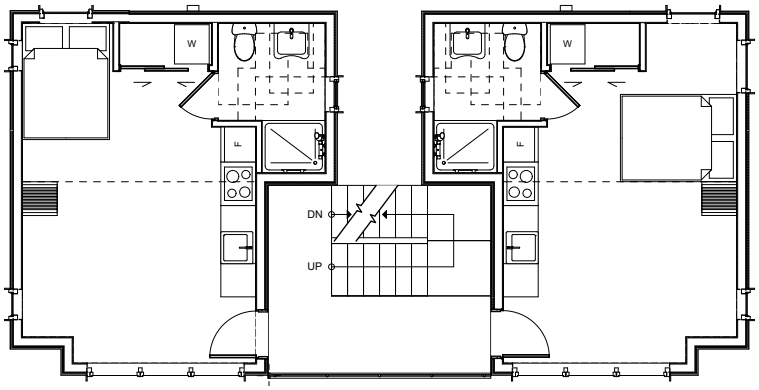


Figure 11: adapted framing plan for a typical upper level floor in 1823 13th Ave (1823 13th Avenue 2020). Colored unit diagram overlayed.

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 12: photo of 2010 E Jansen Ct taken in spring of 2024.



This project was built behind an existing house which has been converted into a triplex. The extra long lot, alley and at least one setback departure enabled the project.

Figure 13: typical upper level floor plan (Jansen Court Apartments, SDR Packet 2017).

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

Figure 15: 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 16: renderings of the sola16 apartments at 2351 Franklin Ave E (Sola16 Apartments, SDR Design Guidance Proposal 2013).

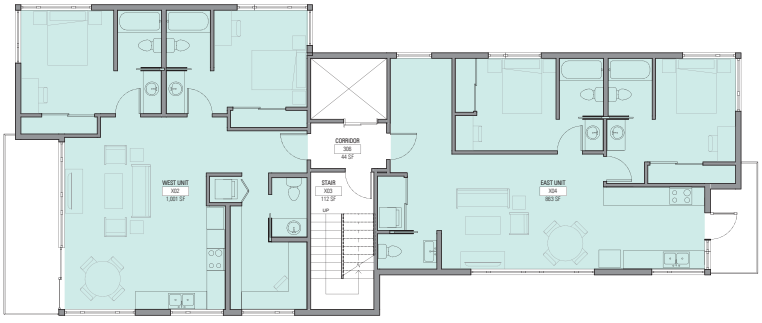
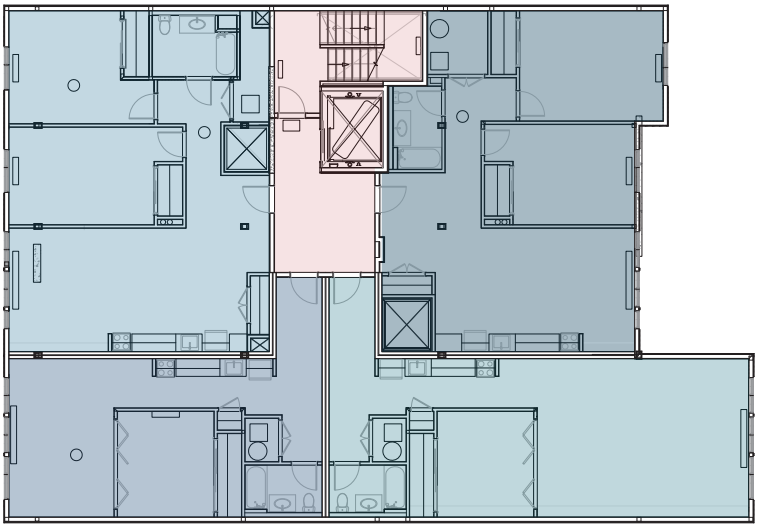


Figure 17: third and fourth floor plans showing large, 2br units (Sola16 Apartments, SDR Design Guidance Proposal 2013).



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 18: image of 3208 Rainier Ave S showing zero side setbacks and fire wall.

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

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 20: recolored render of the 101 John St Apartments (101 John, Mater Use Permit Set 2013).

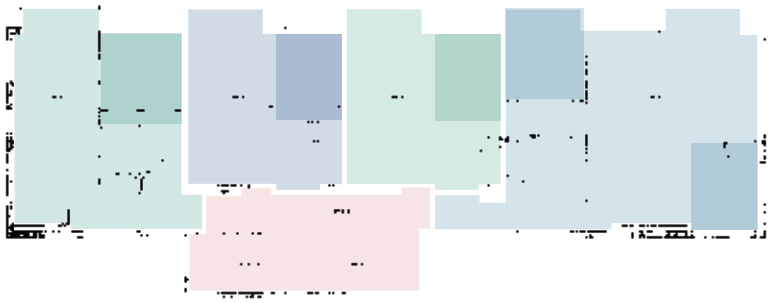


Figure 21: typical upper level plan (101 John, Mater Use Permit Set 2013).

housing economics

The primary observation taken from this survey of existing MPABs, along with the two stair buildings also observed during this work, is that smaller units seem to be preferred, particularly for rental housing. As has been mentioned, The lack of unit density limits in most of Seattle's multifamily zones has perpetuated this trend.

The economic analysis that appears later in this project has been done with no formal training in real estate and does not claim to be a definitive answer to the feasibility question. That being said, going through the process of learning basic real estate concepts, and talking with industry professionals has lead to a better understanding of what goes into the financial feasibility of a multifamily housing project, and what factors are driving this trend of small units. These factors help to explain some of the difficulty in building smaller multifamily housing projects, especially with larger units, and the patterns observed in the survey of existing MPABs.

Some of the architectural factors that effect project economics are the construction means and methods used, typically as dictated by building code, and the scale and unit mix of the project. The IBC covers most multifamily housing types, while the IRC (International Residential Code) covers single-family homes, duplexes, and townhomes, up to three stories. Generally, the IRC is a simpler code that calls for fewer fire mitigation measures. From talking with industry experts, it has become clear that building under the IBC can save on construction costs. This, in combination with the fee simple sale potential of these smaller housing types, can make them more attractive for developers, and may explain the current townhouse boom in Seattle.

The unit mix of a project simply refers to the number and size of units in the building. As was observed in the survey of existing MPABs, developers seem to favor more, smaller units. As will be discussed later on in this thesis, this is because smaller units rent for higher prices per square foot. It's the same economics that leads people to live with roommates to save money. Together, these factors lead to family-sized housing being predominantly larger townhomes and detached homes, and apartments being small studios and one bedrooms. This makes it difficult to find affordable family-sized housing.

As long as these economic forces remain what they are, e.g. the IRC is not extended to include larger housing types, it will be necessary to create regulatory frameworks that incentivize family-sized housing if we want to see substantially more of it built. This conclusion lead to the proposal for a new zone presented in the planning thesis. Even with a zone intentionally designed to produce this housing, it is possible that economic factors will still limit it's production. The financial feasibility of these project will be further explored in Chapter 6.

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 22: UR zone description.

the Urban Residential zone

This zone description (fig 22) is the product of the previous planning thesis. It is not intended to represent a fully fleshed out zone description but rather a framework for a zone that collects the basic elements that might incentivize single-stair multifamily buildings with larger units. If this strategy was used to increase density at the edges of Seattle's existing NR zones, more affordable family-sized housing could be built in areas with access to opportunities and amenities.

Figure 23 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 utilize MPABs as mid-density infill in what are currently single-family 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 more units for families or co-living with easy access to daily needs and neighborhood amenity spaces.

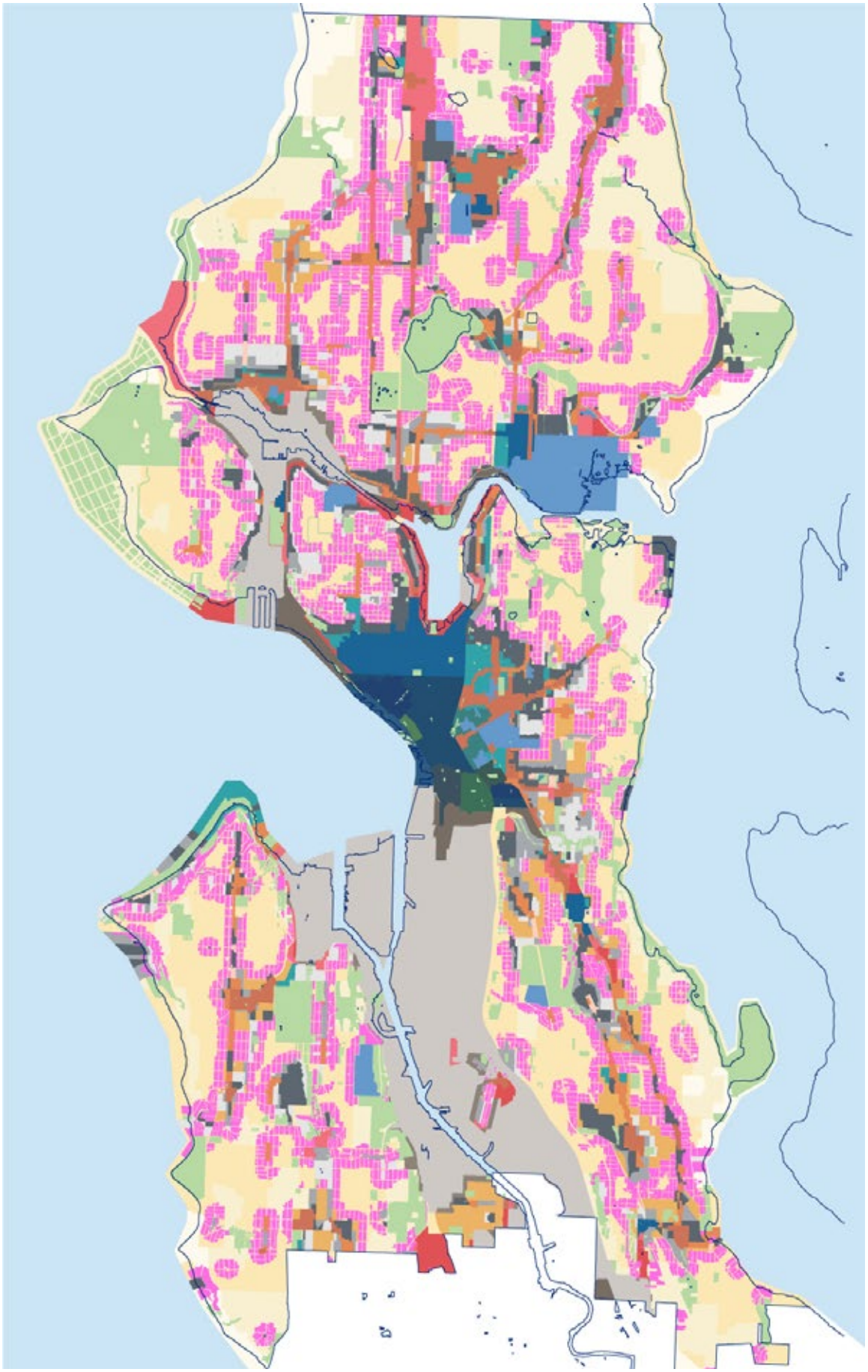
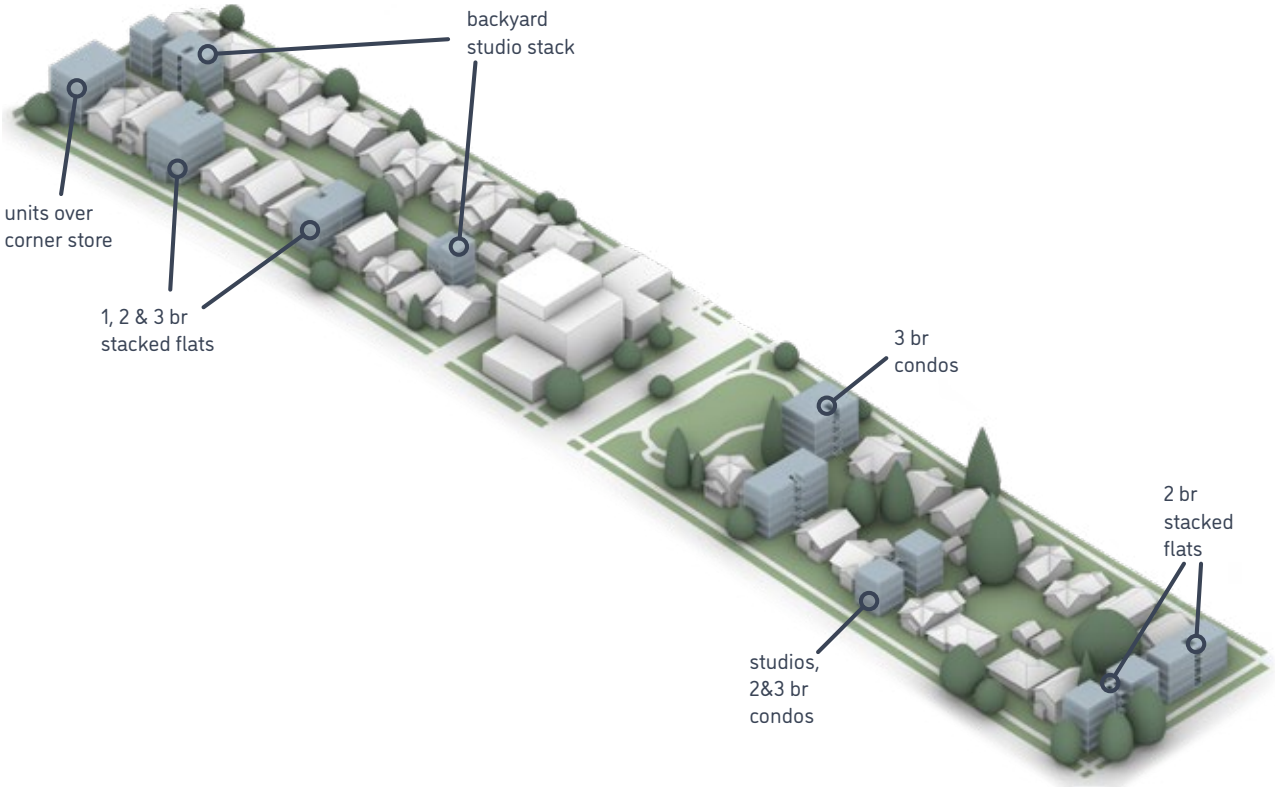


Figure 23: proposed location of Urban Residential zone shown in hot pink, overlayed on existing Seattle zoning map circa 2024.

map key

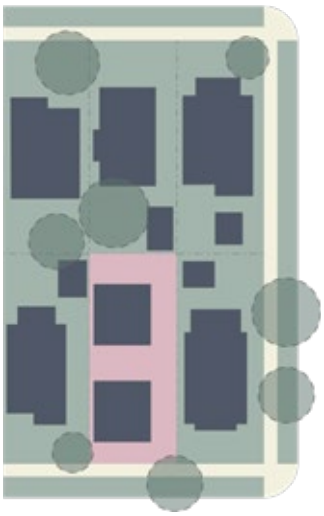
- Urban Residential (UR)
- Neighborhood Residential 3 (NR3)
- Neighborhood Residential 2 (NR2)
- Neighborhood Residential 1 (NR1)
- Lowrise 3 (LR3)
- Lowrise 2 (LR2)
- Lowrise 1 (LR1)
- Neighborhood Commercial 3 (NC3)
- Neighborhood Commercial 2 (NC2)
- Neighborhood Commercial 1 (NC1)
- Commercial 2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



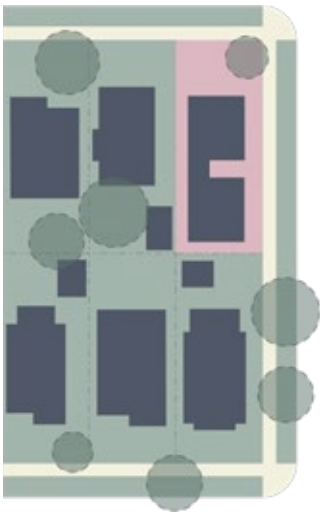
3. Typological Studies

block context

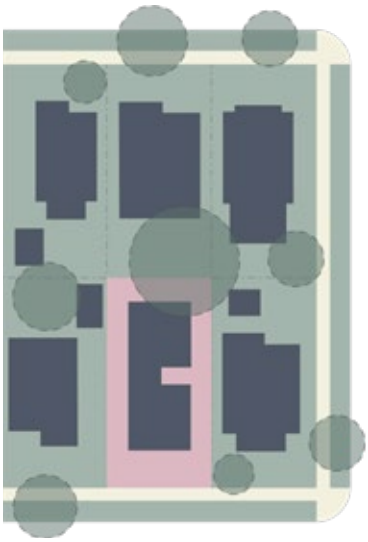
The lot analysis conducted in the prior planning thesis settled on the use of 4000 and 5000 square foot lots for the purposes of testing massing strategies. These sizes are based on typical Seattle lot dimensions of 40 or 50 feet wide by 100 feet long. Many of the city's lots do not adhere strictly to these dimensions but fall within the range. There are also parts of the city with 120 foot long lots, but these are less common. This thesis will use the 4000 and 5000 sf lots to test ideas. These two options should be considered as ends of a spectrum rather than absolutes (Pressprich 2024). Beyond lot dimensions, Seattle presents several other contextual variables, primarily the presence of an alley. Other variables include neighboring uses such as parks and open space, location within the block, and trees. Variables within the lot besides lot size include slope, use of a double lot, retention of an existing home, and again, trees. This section will explore common permutations of these variables for use in the following design studies.



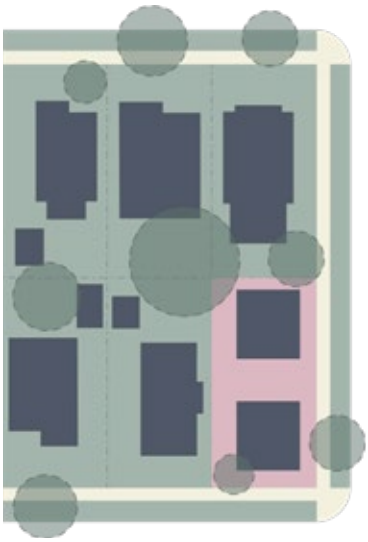
4000sf
no alley
midblock



4000sf
no alley
corner



5000sf
no alley
midblock

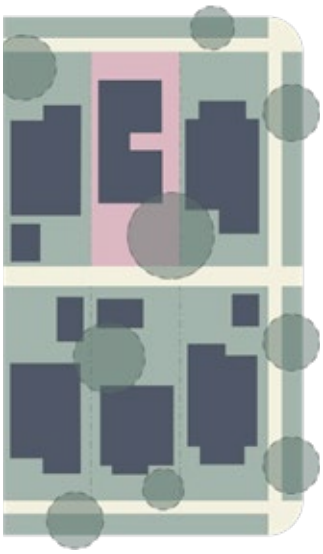


5000sf
no alley
corner

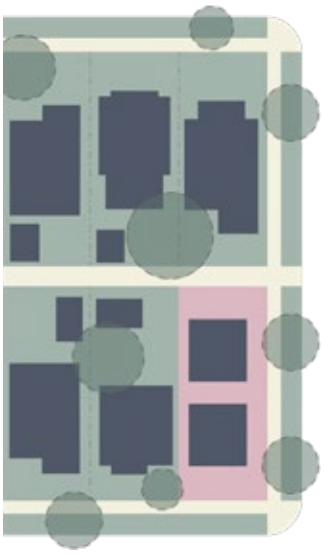
alleyways

A number of Seattle's blocks include alleys. These spaces provide the benefit of rear lot access for parking and trash storage. In the context of this project, they also have the added benefit of providing better access for dwelling units at the back of the lot, as in the case of retaining an existing home. Seattle's alleys are some of the most interesting spaces in the city and could provide an intimate and desirable access path for the higher density buildings this project provides. Eventually, these spaces could become a secondary street grid with it's own unique character.

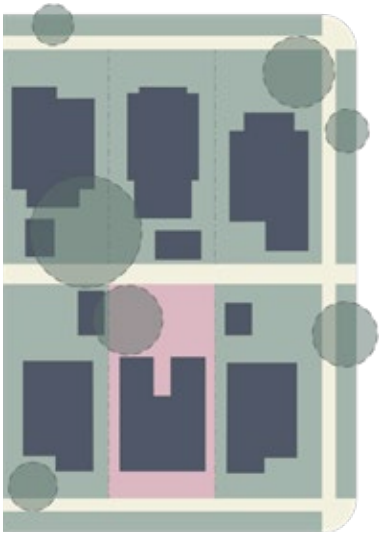
Figure 24: alley near Greenwood.



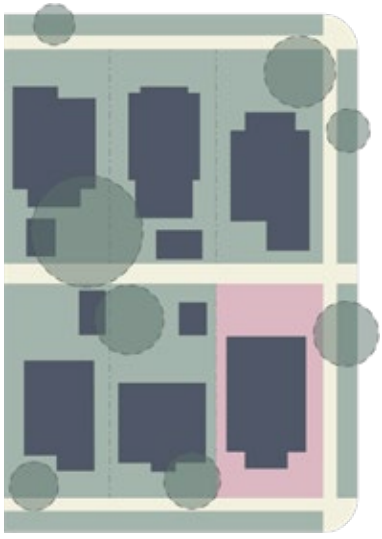
4000sf
alley
midblock



4000sf
alley
corner



5000sf
alley
midblock

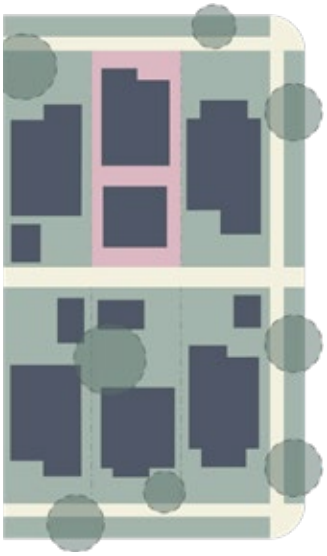


5000sf
alley
corner

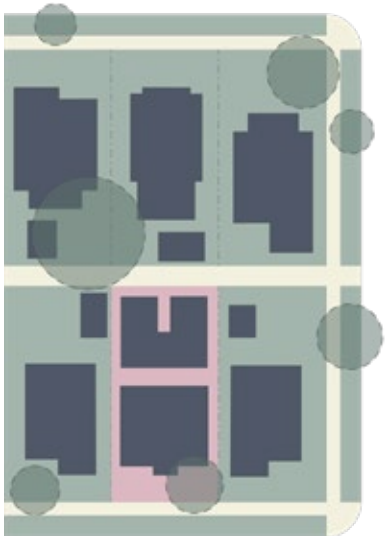
Figure 25: Images of 1611 S Weller St. which has an MPAB behind it. See planning thesis for details.

keeping existing homes

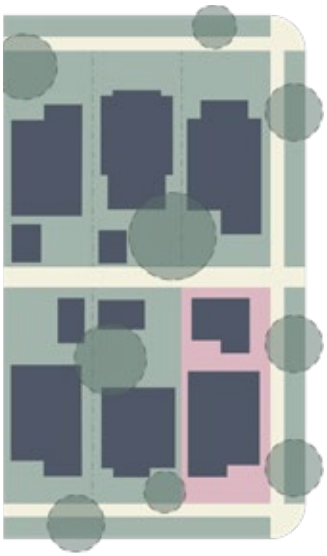
The land use code proposed by the planning thesis attempts to incentivize retention of existing homes on lots. Retaining these houses does pose several challenges in terms of construction and liability, i.e. they may be difficult to work around, and may need to be substantially updated. However, keeping existing homes also provides many benefits. The most significant are the environmental benefits of building reuse, potentially lower rents associated with older structures, and the ability to ad density while still maintaining a smaller residential scale that neighbors often desire (Pressprich 2024).



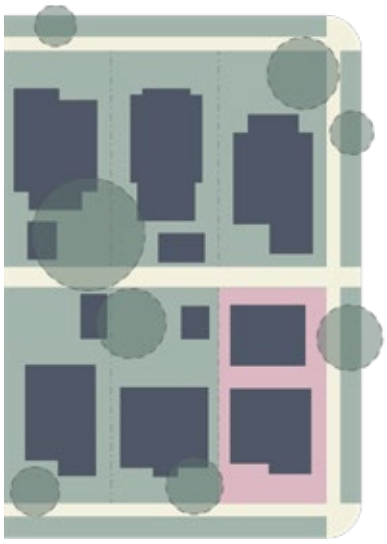
4000sf
alley
midblock
existing home



5000sf
alley
midblock
existing home



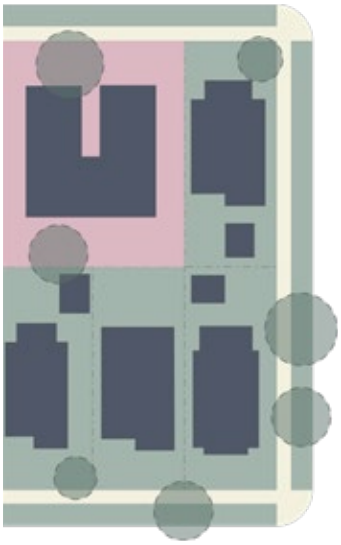
4000sf
alley
corner
existing home



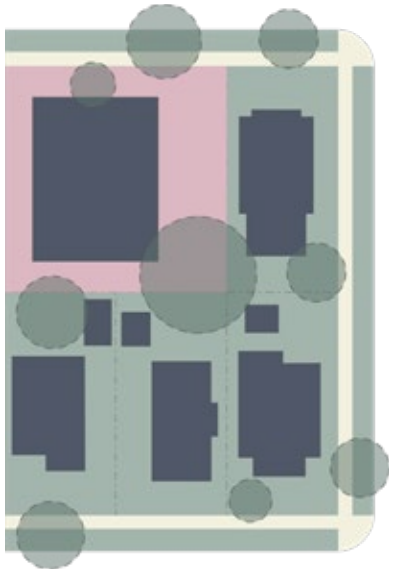
5000sf
alley
corner
existing home

double lots

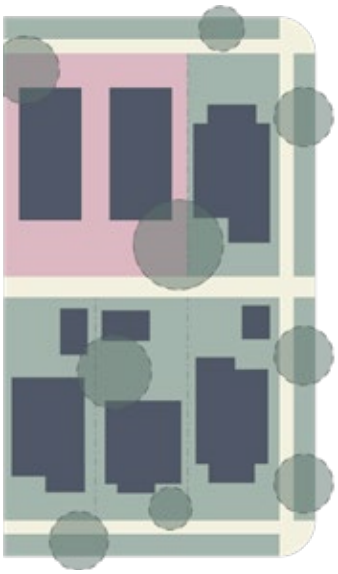
It would be possible for a developer to acquire several lots and develop them as a single building or a cluster of MPABs. This may be more economically efficient for the developer and has the added benefit of a more efficient use of open space. Due to the limitations of Seattle's single-stair building code, the buildings would probably contain about 20 units. A double lot would be a logical test since it would be limited to 16 to 20 units by the proposed land use code. More than two lots may be less desirable due to the larger scale of the building and reduces access to exterior walls. Limiting this possibility in some way would be something to consider.



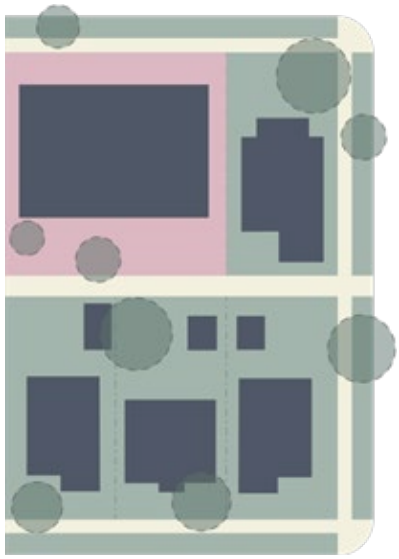
4000sf
no alley
midblock
double lot



5000sf
no alley
midblock
double lot



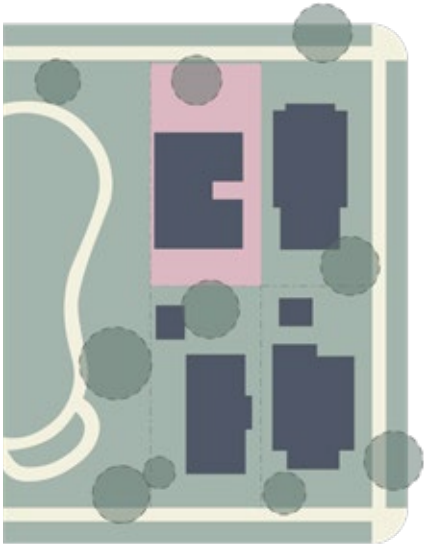
4000sf
alley
corner
double lot



5000sf
alley
corner
double lot

other scenarios

There are many other contextual scenarios that these MPABs might be built within. The intention of the proposed zone definition is to provide enough flexibility within the regulatory envelope to allow an appropriate response to the surrounding context. This may be as simple as the ability to shift the building farther to one side of the lot in response to an open space, or one of Seattle's many nonconforming homes that is less than 5 feet from the lot line. More complex variations could include a corner store, as proposed in the One Seattle comprehensive plan update.

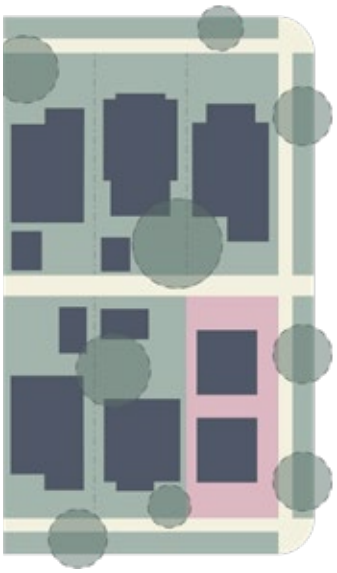


5000sf

no alley

midblock

park proximity



4000sf

alley

corner

corner store

next steps

These context studies represent some of the most common scenarios for the application of the proposed Urban Residential zone. The next chapter will look at four of these scenarios in more detail with full schematic designs. These designs will attempt to represent a wide range of possibilities, favoring the most desirable outcomes.

4. Design Studies

The following four designs were done to test the UR zone parameters and explore how single-stair buildings might fit into Seattle's single-family neighborhoods. Two of the designs have a more residential character, using pitched roofs and other elements that make them feel more like large houses than small apartment buildings. The other two designs lean into classic small apartment characteristics such as brick cladding and simple, rectangular massing.

Going through the process of designing these four buildings helped to clarify some of the proposed UR zone's strengths and weaknesses. All four designs are intended as best case scenarios. It is certainly possible that less desirable buildings could be built under the UR zone, but this is true of any zone. This section is followed by suggested revisions to the UR zone that further encourage desired outcomes, or discourage less desirable outcomes, as observed during the process of designing these buildings.

a house for many families

This proposal presents one of the most typical block contexts: a 4000sf, mid block lot with no alley access. Traditional elements are used in playful ways to mix the old with the new. The massing makes an effort to blend with the surrounding context through the use of two smaller structures and pitched roofs and dormers. Vertical wood siding softens the building while playfully arranged windows with mullions give a more residential feel.

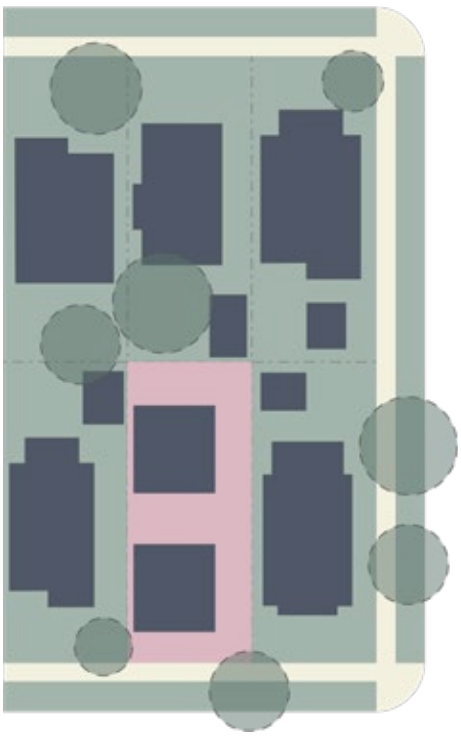
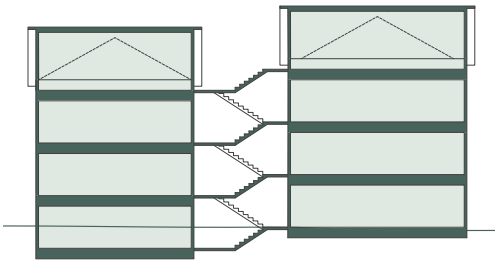


Figure 26: rendering showing overall massing of "a house for many families."

Figure 27: (right) site plan.



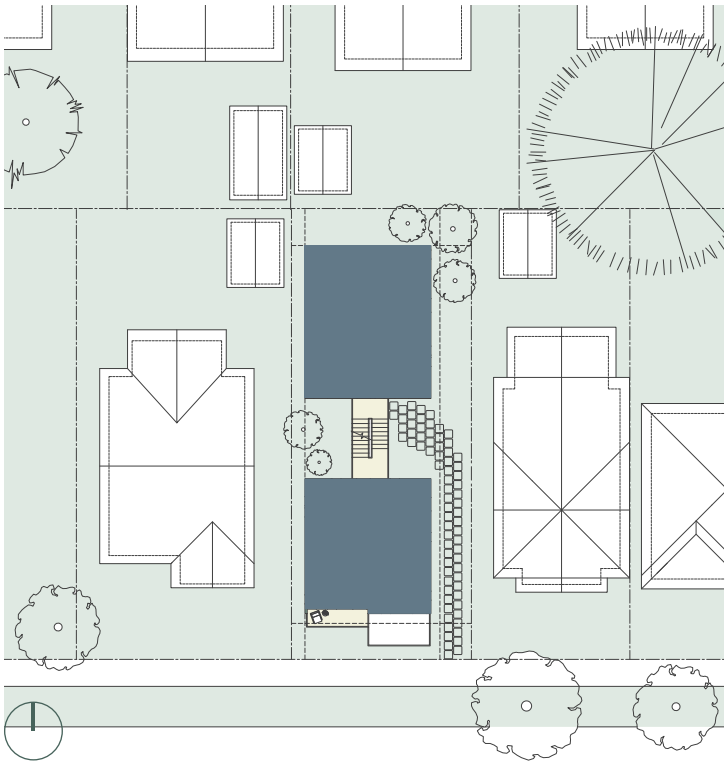


Figure 28: (above) North/South section.

Figure 29: (below)rendering of street facing facade.

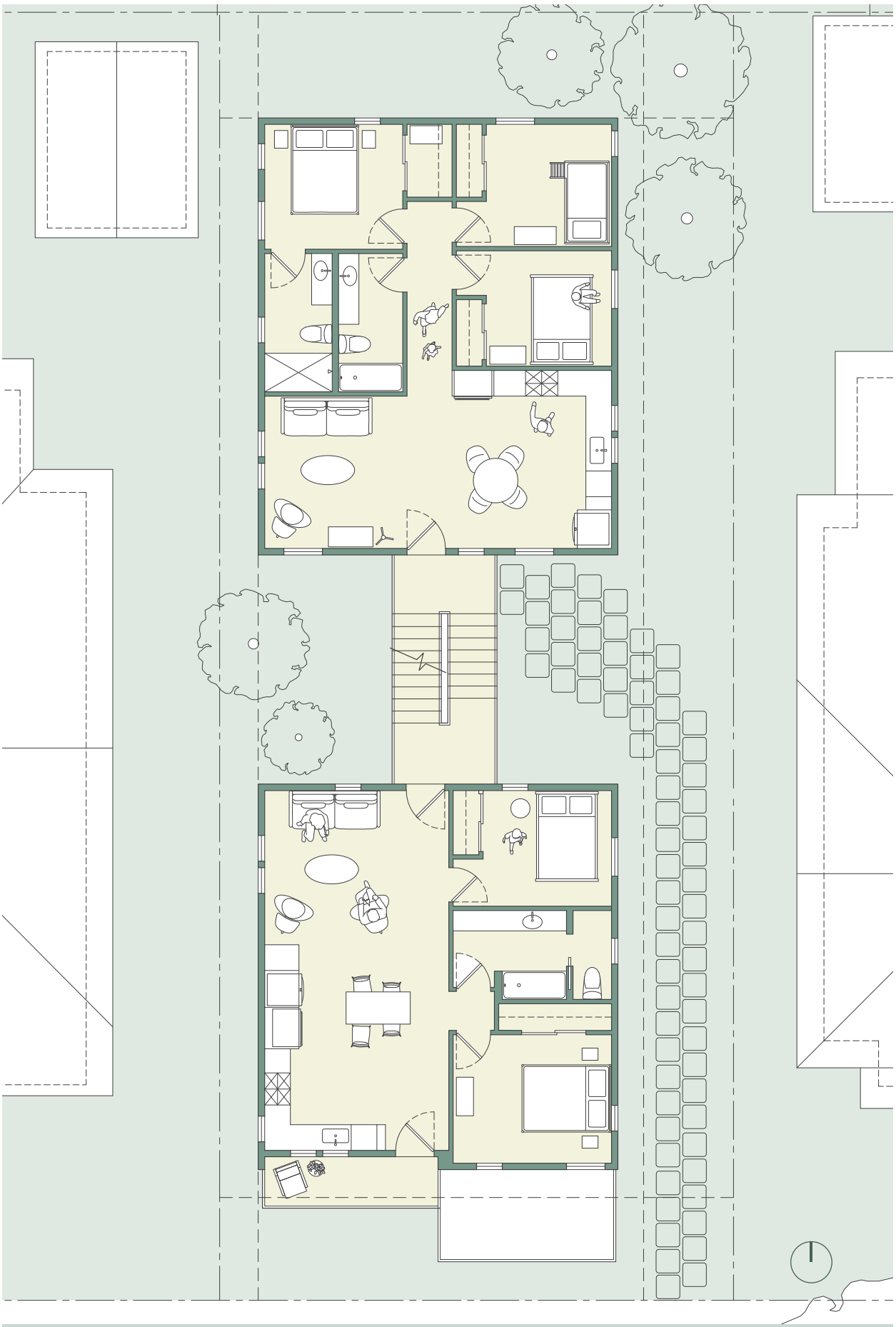


Figure 30: site & 1st, 2nd, 3rd floor plan

lot area: 4,000 sf

allowable FAR: 6,400 sf

built FAR: 6,280 sf

rentable area: 6,349 sf

floor plate efficiency: 100%

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

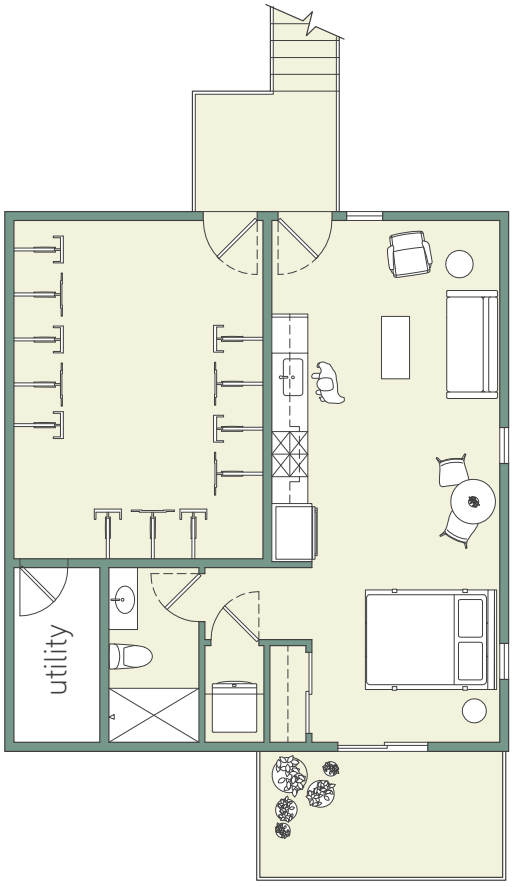


Figure 31: lower level plan (exposed basement)

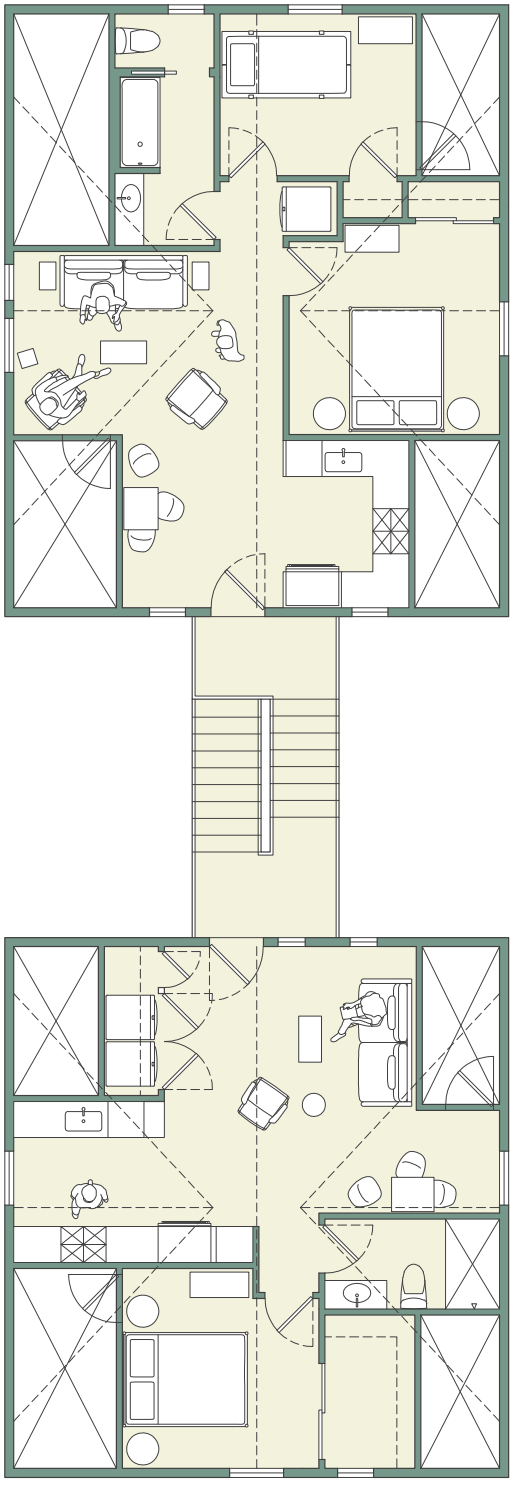


Figure 32: 3rd & 4th floor plan (gables & dormers)

precedents

Figure 33: Boulders at Green Lake (Johnston Architects).

Figure 34: 5904 22nd Ave N (SHW): vertical wood

Figure 35: rendering of exterior, switchback stair between buildings.

Figure 36: interior render looking south, early morning.

Figure 37: interior render looking south east, mid-morning.

Figure 38: interior render looking south west, early afternoon.

Figure 39: interior render looking west, late afternoon.

Figure 40: interior render facing stair, evening.

keep the tree on the corner

The existing birch tree on this 4000sf corner lot was saved due to the flexible zone requirements and low lot coverage. The small apartment building is a single stack of eight flats, each with a front porch. The corner lot condition has allowed the building to be oriented to the long side of the lot, creating a larger front facade with more opportunities for interaction with the street. The building is a simple brick box with classic double hung windows, referencing traditional small apartment buildings that were once built in residential neighborhoods.

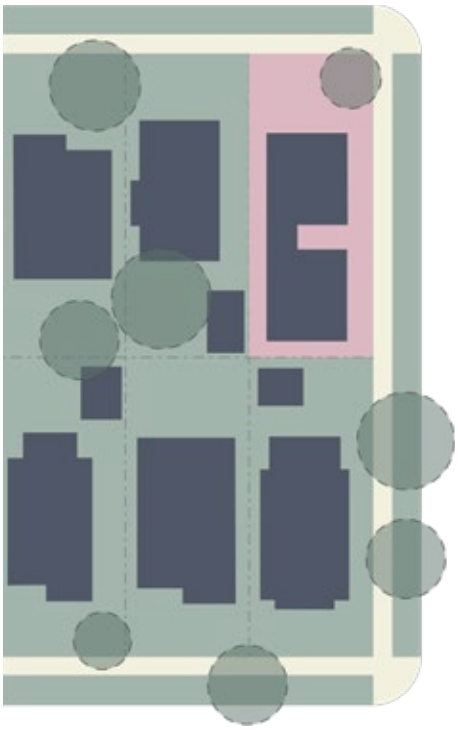


Figure 41: rendering of street facing facade for "keep the tree on the corner."

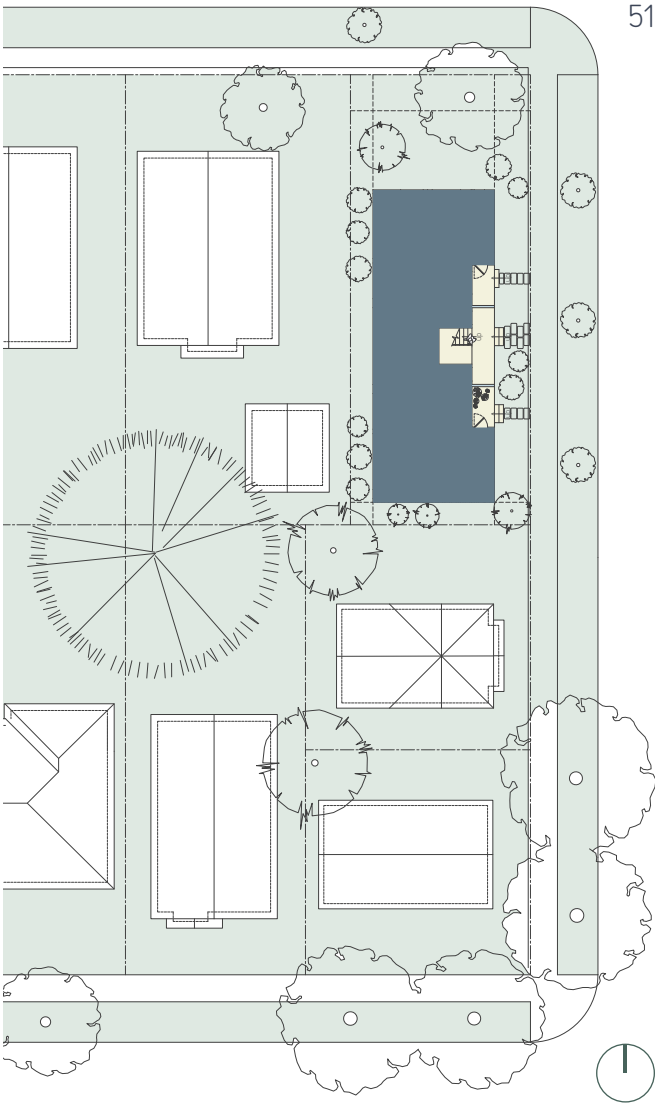


Figure 42: (right) site plan.

Figure 43: (below) rendering showing birch tree on right.

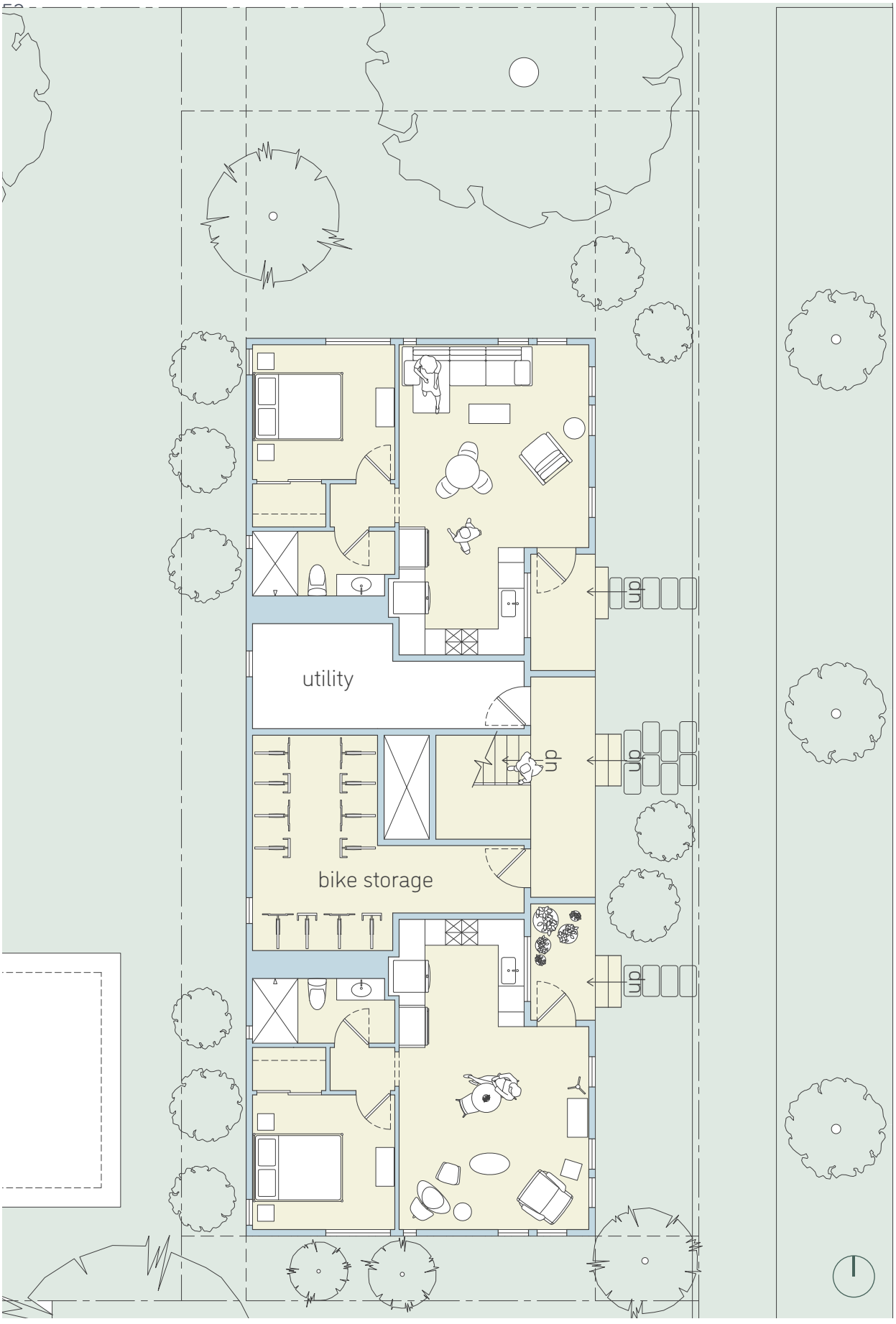
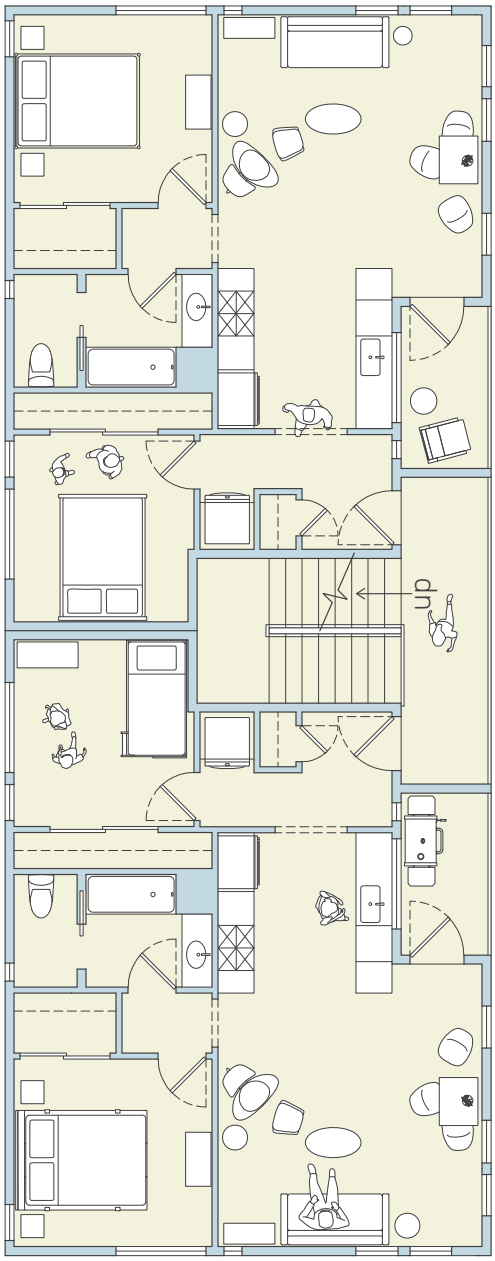


Figure 44: site & ground floor plan



lot area: 4000 sf

allowable FAR: 6,400 sf

built FAR: 6,400 sf

rentable area: 5,954 sf

floor plate efficiency: 93%

allowable coverage: 1,800 sf

built coverage: 1,600 sf

height: 40'

total units: 8

unit mix: 6 2br / 2 1br

Figure 45: 2nd, 3rd & 4th floor

precedents

Figure 46: 711 Belmont Place E (Zillow.com)

Figure 47: Park Modern: 5612 University Wy NE. (Build LLC). Symmetry, carved porches.

Figure 48: rendering of view from sidewalk.

Figure 49: rendering of balcony.

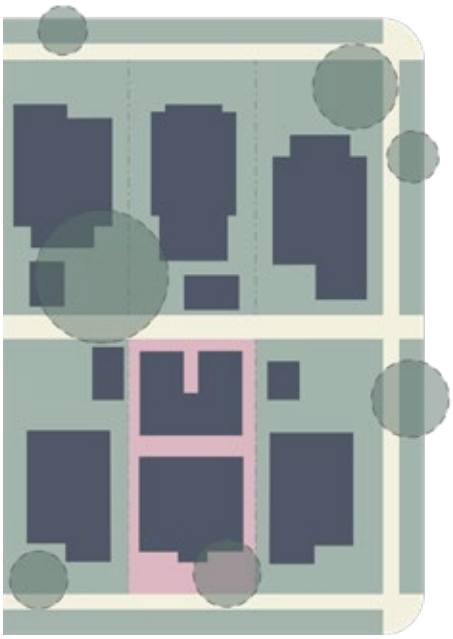
Figure 50: interior render looking south, morning.

Figure 51: interior render looking south east, afternoon.

Figure 52: interior render looking north east, afternoon.

Figure 53: interior render looking north, evening.

Figure 54: render of balcony and front door, evening.



backyard infill

A large, unused backyard has been filled in with 8 smaller units, allowing different family structures to be a part of this single-family neighborhood. The units have been offset to maximize the efficiency of the stair. The pitched roof and dormers help reduce the scale of the building and blend with the low rise context.

Alley access allows for a separate private entrance to the property, preserving the privacy of the existing home. The alley access contributes to an intimate secondary street grid where neighbors can get to know each other.

Figure 55: rendering of "backyard infill," viewed from alley.

Figure 56: (right) site plan.

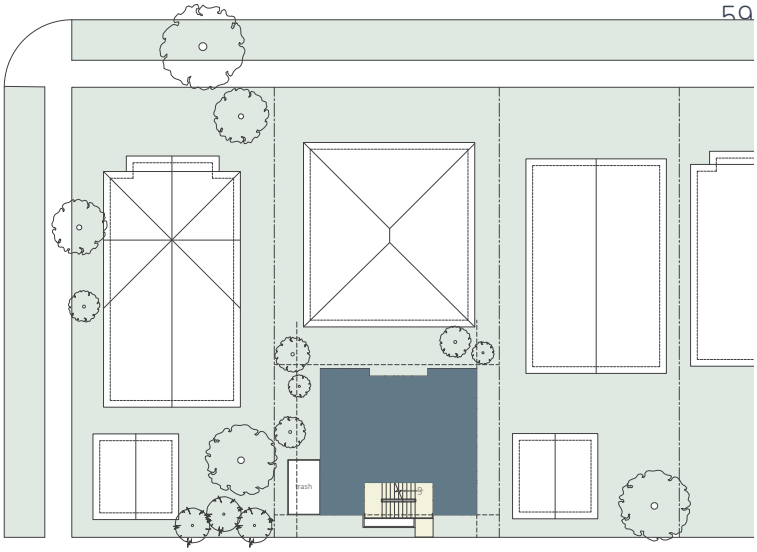
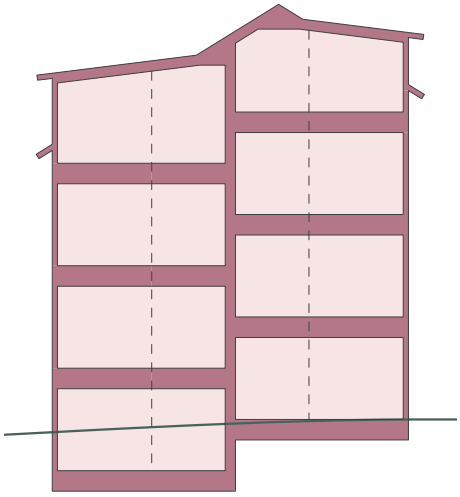


Figure 57: (below) section showing offset floors.



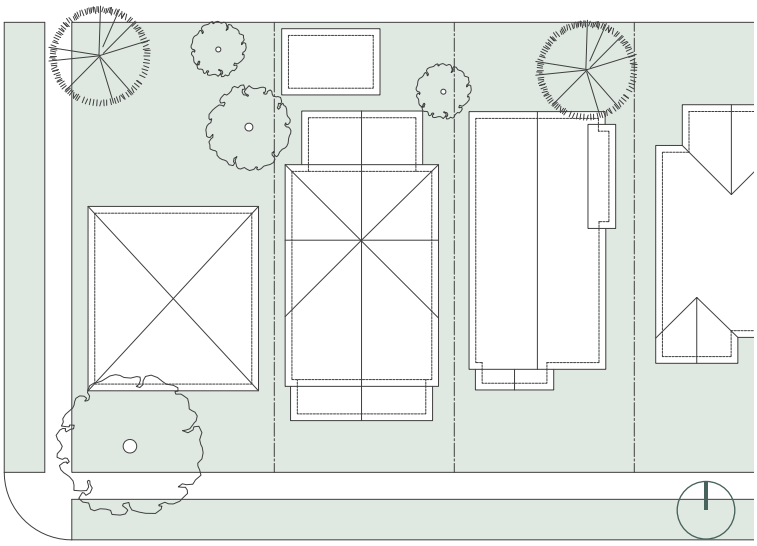


Figure 58: (below) rendered view over existing house.

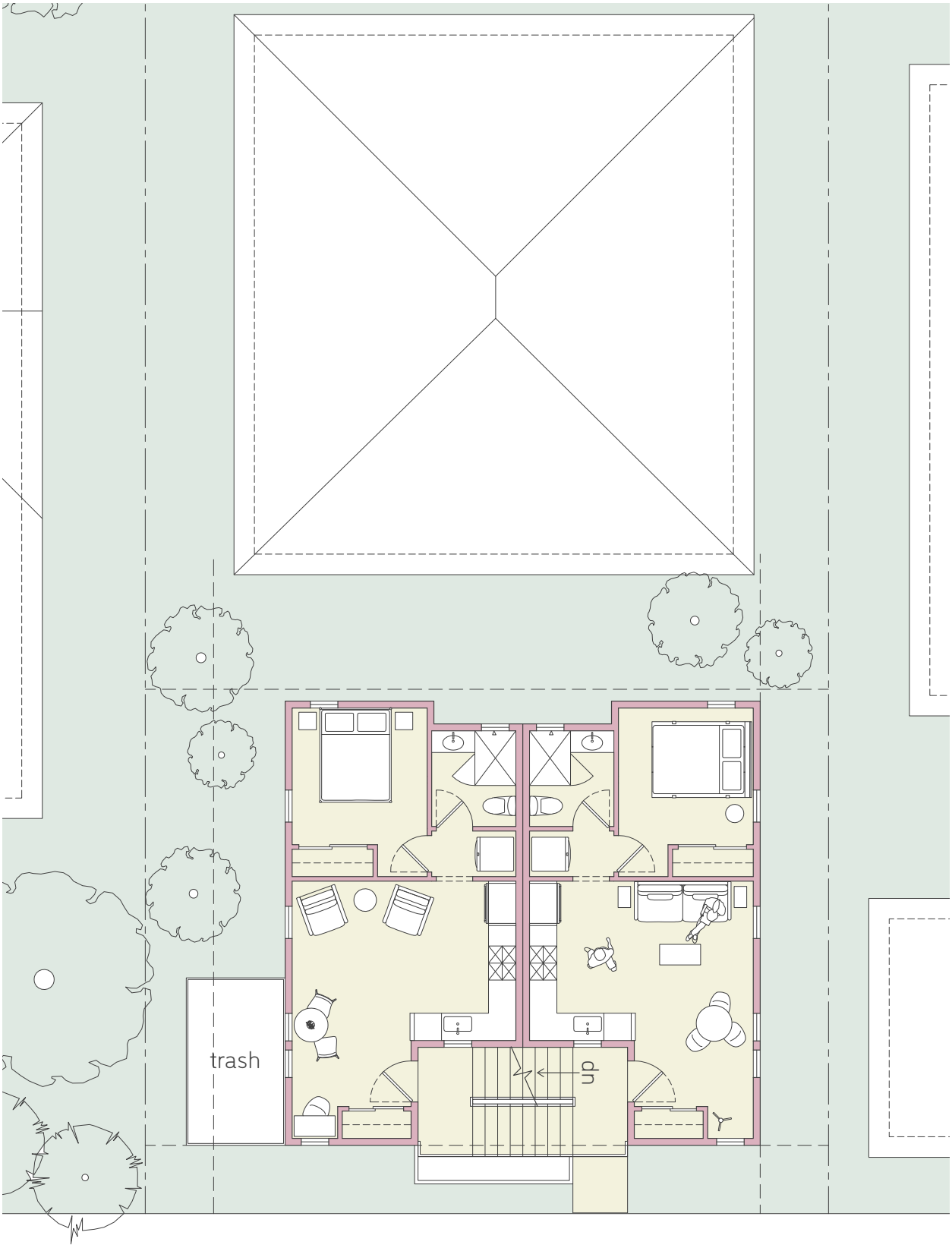


Figure 59: site & 1st, 2nd, 3rd floor plan

0 5 10ft

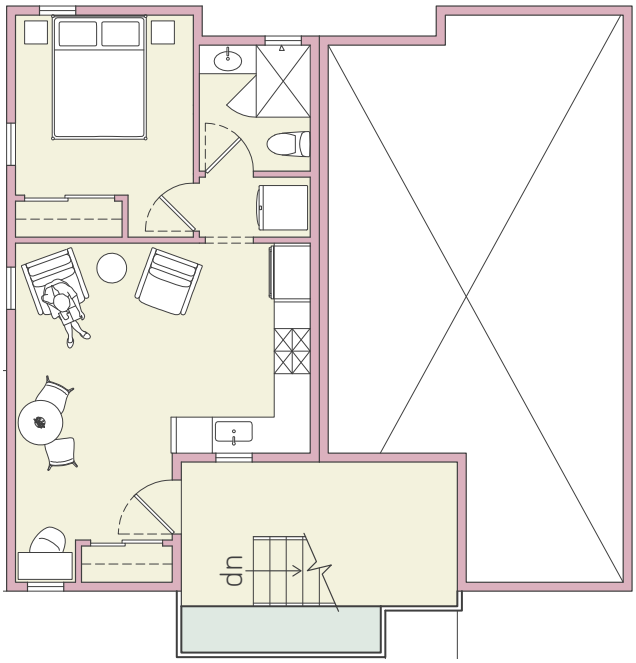


Figure 60: lower level plan (exposed basement)

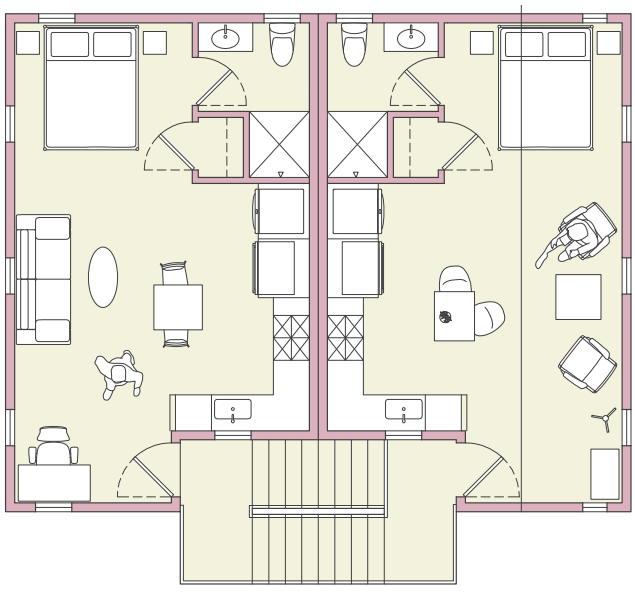


Figure 61: 4th floor plan (gables & dormers)

lot area: 5,000 sf

allowable FAR: 8,000 sf

- existing home footprint: 1,400 sf

= 6,500 sf

built FAR: 3,400 sf

rentable area: 3,900 sf

floor plate efficiency: 100%

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'

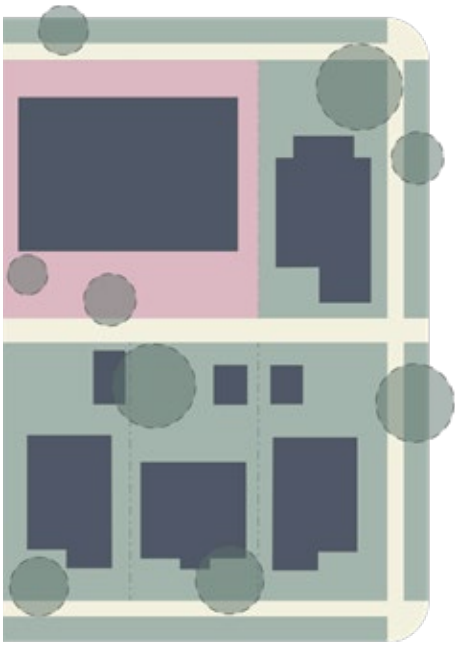
total units: 8

unit mix: 6 1br / 2 studios

precedents

Figure 62: Swedish asymmetrical roof & shed dormers (A&H Architecture).

Figure 63: render showing stair.



double lot with parking

Two lots have been combined to enable a larger building with bellow grade parking. The single-stair code limit of four units per floor served by the stair requires 8 of the 20 units to be smaller, first floor studios, with larger units on the upper levels. These constraints lead to a wide variety of unit sizes, creating the potential for a diverse community of many ages and incomes to share spaces.

The higher lot coverage resulting from fitting in the parking will need to be addressed in the UR zone description. Rain water infrastructure or solar panels, as seen on the roof of this building, could be used as a trade off for the added lot coverage.

Figure 64: rendered aerial view of "double lot with parking."

Figure 55: (right) site plan.

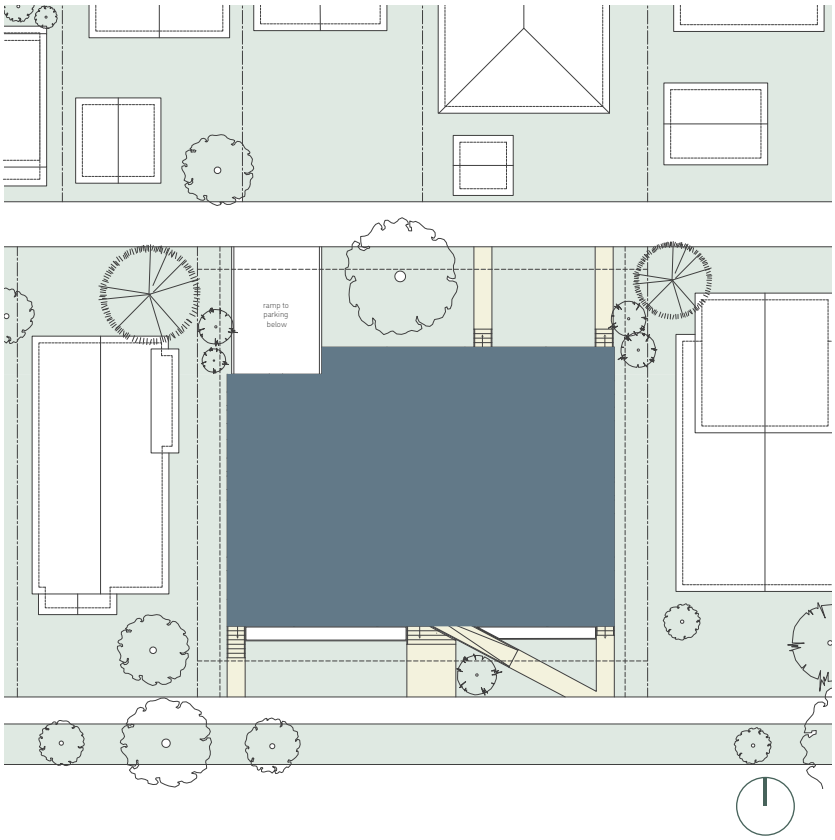


Figure 56: (below) rendered view from street.

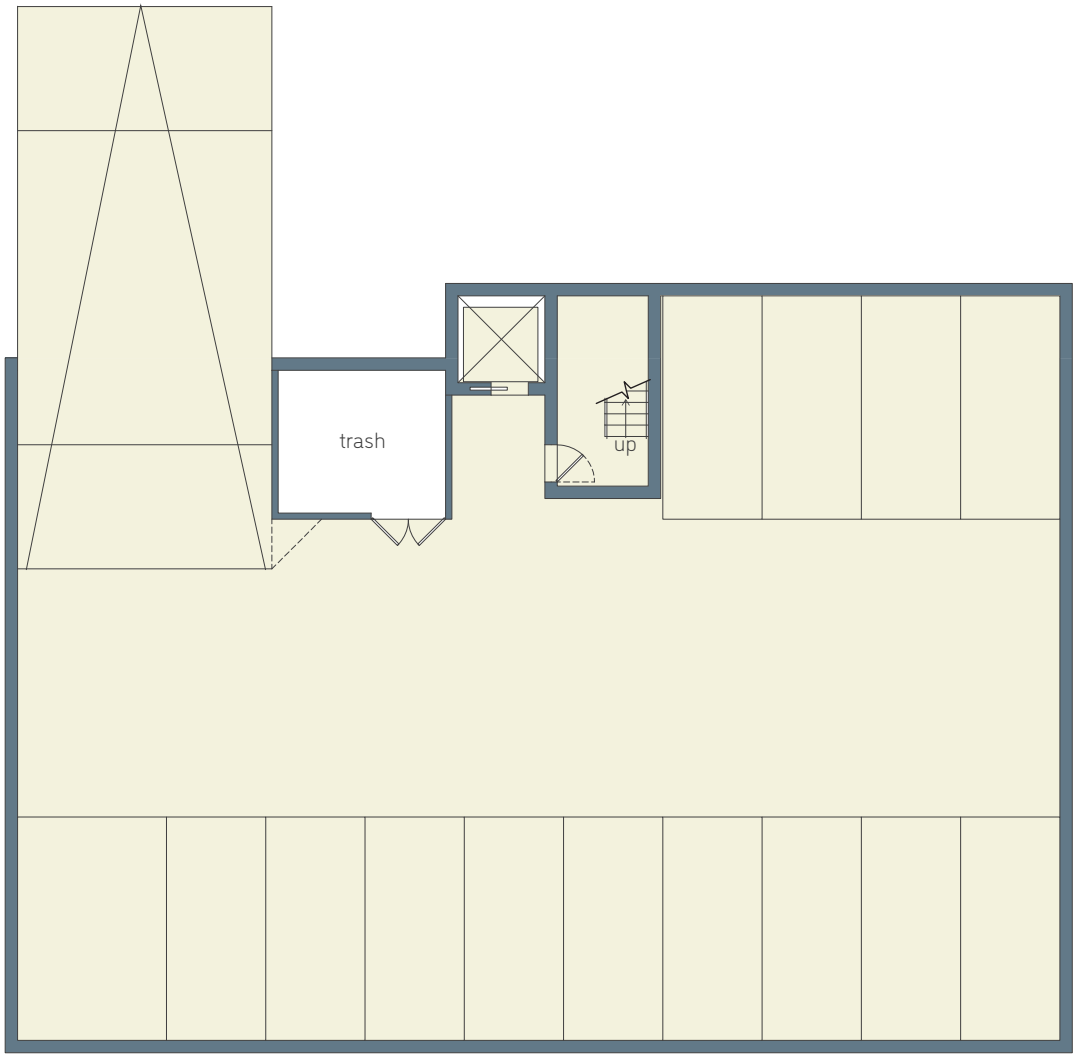


Figure 57: lower level plan (parking below grade)

Figure 58: site & 1st floor plan

0 5 10ft

Figure 59: rendering of view from balcony.

lot area: 10,000 sf

allowable FAR: 16,000 sf

+ 200 sf for bike storage

+100 sf for 4' upper level setback: 16,300 sf

built FAR: 16,170 sf

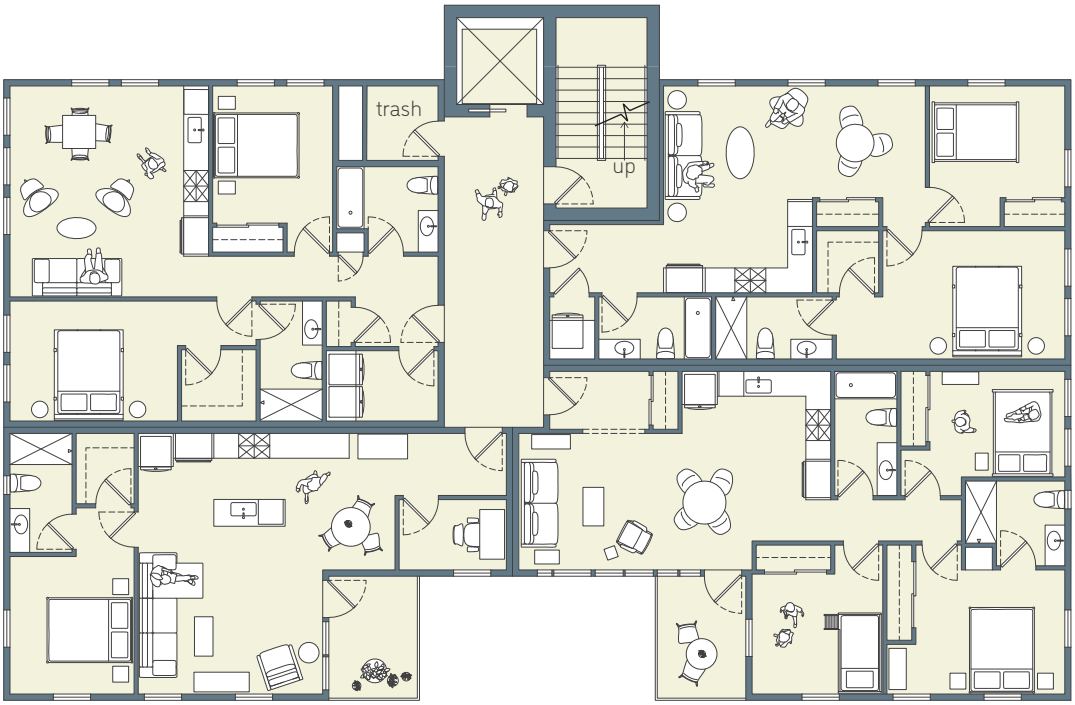


Figure 60: 2rd, 3rd, 4th floor plan

rentable area: 14,150 sf

floor plate efficiency: 87.5%

allowable coverage: 4,500 sf

built coverage: 4,750 sf*

*(add 5% bonus for rooftop solar or bioswales)

height: 43'

total units: 20

Figure 61: yes

precedents

Figure 62: 444 NE Maple Leaf P. planted patios

Figure 63: 2037 Boylston Avenue E: symmetry, brick, double hung windows

Figure 64: (above) rendered view from balcony.

Figure 65: (below) rendered view from sidewalk.

5. Impacts on Previous Work

UR zone revisions

The process of designing the four test buildings lead to several revisions that should be made to the Urban Residential zone description originally proposed in the previous planning thesis.

The two designs that utilize pitched roofs suggest adding a height bonus for their use. Three to five feet of additional height could be granted for the use of pitched roofs. A minimum pitch would be needed to ensure desired outcomes. It would not be permitted to add this bonus to the existing five foot bonus for bellow grade stories. It is also possible that pitched roofs would still not be widely used due to the added difficulty of designing and building them, and potential loss of rentable area.

Additional lot coverage was needed to fit the parking bellow the double lot example. If parking is a desired outcome, additional coverage should be granted in exchange for roof top solar or rain water management strategies such as bioswales. The possibility of higher lot coverage may invite less desirable development such as townhomes or large single-family homes. To avoid this, lot coverage can be tied to unit count, ensuring additional lot coverage is only achievable at high enough unit densities.

The double lot example also brings up the possibility of larger developments. While more housing is certainly desirable, and larger developments are often more appealing for developers, buildings exceeding a certain size would not fit well into Seattle's residential neighborhoods. This possibility would drastically reduce the likelihood of something like the UR zone being adopted due to political push back. To combat this, either lot assemblage would need to be limited, or a cap should be put on the unit density.

Open space requirements may need to be waved for projects that retain existing homes. As seen in the example exploring this, open space is difficult to create in a meaningful way. This would be a reasonable instance in which to prioritize housing.

Finally, the rear setback could be reduced to allow more space between multiple buildings on one lot, as in the case of the first example with two buildings connected by a single-stair. This adjustment is less necessary than the others but could help with general design flexibility, which is a goal of the zone.

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.

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.

Figure 66: revised UR zone description.

6. Real Estate Analysis

pro forma assumptions and methodology

There are a number of assumptions and generalizations that needed to be made in order to assess the feasibility of these buildings. Pro formas typically utilize a set of assumptions in order to make informed predictions about the future value of investments ("What Are Pro Forma Financial Statements?" 2021). The major difference between most pro formas and this analysis is the broad generalizations that were required in order to ask the question: Are these buildings likely to be built, by the private market, within the next decade?

There are two major generalizations within this question. The first is that the analysis is considering a set of buildings with similar features and "typical" construction. The second, and maybe more difficult generalization is the timeframe of the next ten years. This requires some educated guesses to be made about the economy, interest rates, the housing market, and the construction industry. These assumptions are hard to make for multiple reasons, including the recent fluctuation within the economy as global markets weathered and recovered from the COVID 19 pandemic. Current market conditions make it difficult to build anything, according to Alex Cohen, who develops multifamily housing in Seattle (Cohen 2024) (Ho 2024). This analysis assumes that, over the next decade, it is likely that market conditions will improve and housing will be more appealing for investors.

The other major consideration regarding this analysis is my own lack of expertise in the field. I am not a real estate student, and do not claim any expertise in the field. This analysis was done primarily as a learning exercise, and secondly as a feasibility study. Any and all assumptions and their resulting conclusions should be taken with this in mind. I was fortunate enough to be able to consult with a number of professionals and academics who helped me gather a set of relatively reasonable assumptions, however their accuracy over the next decade cannot be guaranteed. Further, small changes in certain numbers, and the close interactions between them, may potentially skew the results of the analysis. For example, small fluctuations in capitalization rates and interest rates can have relatively dramatic effects on the internal rate of return, as well as other outcomes.

For these reasons, this analysis should not be taken as a business suggestion or hard fact; instead, these numbers give a broad sense of whether these buildings might be built, and give insight into some of the financial barriers to building larger, family-sized rental units in Seattle. The major assumptions and generalizations are stated in the table below.

Land cost per square foot	$220.00	This average was compiled from a study of present-day land costs from around Seattle using data from RedFin and King County property records ("King County Department of Assessments: eReal Property," n.d.) (Redfin, n.d.). The full spreadsheet can be found in the appendix.
Average rent per square foot	$3.50-$3.90	A range of prices were set, depending on the size of the unit, and can be found on the first page of the pro forma under "Unit Mix". Rent per square foot goes down as unit size in-creases. These prices were set based on market data, input from real estate experts, and an assumption that rents will continue to increase over the next decade.
Construction cost per square foot	$370.00	A cost of $370.00 per square foot was suggested as a low figure (Khouri 2024). A low estimate seems reasonable considering recent market trends ("United States Construction Market Trends" 2024).
Construction loan interest rate	6.5%	These rates were suggested by Alex Cohen (2024), and reflect reasonable rules of thumb rather than the current market conditions (McCann, n.d.). In the case of interest rates, it is exceedingly difficult to know what these will look like over the next decade.
Mortgage interest rate	5.5%	
Soft Costs	30%	Many pro formas assume soft costs including design fees, engineering, legal fees, and taxes, will be about 30-40% of hard costs ("Pro Forma Analysis and Resilience, Part 1" 2017). This model assumes 30% because this zoning reform is also pro-posing exemptions from design review, MHA fees, and impact fees.
Expected capitalization rate	5%	The cap rate used for this analysis assumes this building to be a mid-range class A property ("Cap Rates in Seattle, Washington" 2023). Cap rates and interest rates are likely to be similar, or at least related (McCann, n.d.) ("Cap Rates, Explained" 2024).
Development period	12 months	Twelve months was suggested as a reasonable timeframe for a small apartment building (Cohen 2024), however national trends indicate that this may be a low estimate (Zhao 2023).
Rent increase per year	3%	Based on discussions with real estate professionals and observations of other pro formas, reasonable rent increases vary from three to five percent (McCann 2024) (Cohen 2024) (McCann, n.d.) (Hoffman 2023), and should reasonably reflect inflation rates.

Vacancy rate	5%	(McCann, n.d.) (Hoffman 2023).
Collection loss	2%	Collection loss results from unpaid rent. This estimate was taken from a real estate pro forma shared by Jeff McCann (n.d.).
Pet rent per month	$25.00	According to the American Veterinary Medical Association, approximately 60% of people in the U.S. own pets (2022). The pet rent assumption is based on personal experience as a pet owner in Seattle. In combination, these assumptions are used to calculate a typical yearly pet rent income.
Utility cost per month	$258	Utility cost assumptions are based on Seattle Public Utility data ("Rates - Seattle.Gov," n.d.), as well as other sources ("Electricity Cost in Seattle, WA: 2024 Electric Rates," n.d.).
Projected inflation	3%	This assumption is based on current economic trends, along with the stated goals of the Federal Reserve ("Why Does the Federal Reserve Aim for Inflation of 2 Percent over the Longer Run?," n.d.). This assumption does not have a major impact on the outcome of the pro forma.
Property management as a percentage of EGI	3%	This assumption is based on current economic trends, along with the stated goals of the Federal Reserve ("Why Does the Federal Reserve Aim for Inflation of 2 Percent over the Longer Run?," n.d.). This assumption does not have a major impact on the outcome of the pro forma.
Property management as a percentage of EGI	13%	Smaller projects tend to be less efficient to manage. According to Cohen, operation expenses should be about 30% of income (2024). This percentage compensates for potentially low estimates elsewhere and brings the total expenses into the 30% range. EGI is the effective gross income of the project.
Repairs and maintenance as a percentage of EGI	5%	(McCann, n.d.).
Property tax as a percentage of value	1%	(McCann, n.d.). The value of the property is determined by the implied value calculated for the first year of stabilized operation.
Insurance as a percentage of value	0.1%	(McCann, n.d.).

Many of the inputs for the financial analysis are based on the form of the building, including floor plate efficiency and unit mix. The inputs used for this base line analysis represent a theoretical building that complies with the proposed zoning standards for a 4,000 square foot lot, and a 5,000 square foot lot. The soft costs for the project are estimated at 30% of the hard costs, which is a typical rule of thumb for development pro formas ("Pro Forma Analysis and Resilience, Part 1" 2017). Construction Loan to Value (LTV) has been adjusted as necessary to achieve a Debt Service Ratio (DSR) of at least 1.25, which indicates that a construction loan could be secured for the project. The amortization period for the permanent loan after construction can be expected to be thirty years (Cohen 2024).

The model assumes the property will be sold after ten years, as is typical of many development pro formas. This assumption does not necessarily reflect reality, but rather creates a reasonable and typical metric for feasibility. Extending this timescale may improve the projects performance, but this would not reflect the typical development assumptions that would normally be used to assess the feasibility of the project.

The final assessment of feasibility is based on several factors: internal rate of return (IRR), net present value (NPV), and the loan-to-value (LTV) ratio previously described. There is no single metric, and no single "right answer" to determine project feasibility, but there are several considerations to be made that revolve around IRR, NPV, and LTV. NPV is calculated using future cash flows, initial investment, and a chosen discount rate (Staiger 2018, 7-8). The discount rate is often chosen based on comparable, alternative investments, such as the rate of return for a U.S. treasury bond (Cohen 2024). A positive NPV is a good indicator of an investment that is worth considering; positive NPV indicates adequate compensation for risk taken, as well as a positive return. IRR inverts the NPV equation to reflect the discount rate when NPV is equal to zero. IRR can be directly compared to the rates of return for alternative investments. Both NVP and IRR are commonly used to evaluate opportunities (Staiger 2018, 8-11).

LTV is the ratio of debt to equity being used to finance a project. When the LTV equals 100%, the project is financed through debt; when LTV is zero, the project is entirely financed through equity. This spectrum essentially shifts risk between the borrower and the lender (Staiger 2018, 64) (Cohen 2024). LTV effects the debt service coverage ratio (DSCR), which compares the net operating Income (NOI) to outstanding debt to measure whether the project will produce enough income to service its debt over time. Lenders will use this metric to assess the risk of a project, and will typically only provide loans to project with DSCRs above 1.25 (Cohen 2024) (Fernando 2023). While a lower LTV (more equity) does not necessarily make a project infeasible, it will affect the NPV. It is also fair to assume a lower LTV could make a project less likely, simply because large amounts of equity can be hard to find.

analysis

This analysis utilizes IRR, NVP, and LTV to determine the likelihood that the proposed building type will be built under the proposed zoning changes. The chosen discount rate can have a major impact on NPV and the perceived feasibility of a project. Rates of 5% to 16% have been suggested to me, with the underlying motivations behind the project being a major deciding factor. Most commercial developers will anticipate returns on the higher end, between 15% and 16% (Cohen 2024) (McCann 2024). Other projects may set lower goals in order to create more affordable housing, but this will not be considered for this initial analysis as it does not reflect a "typical" scenario. Below are the analysis results utilizing a 15% discount rate for two possible FAR and lot coverage combinations.

1.6 FAR 40% lot coverage	LTV	NPV	IRR
8 units, 4,000sf lot	50.6%	-$888,031	6.3%
10 units, 5,000sf lot	52.5%	-$1,182,940	7.2%

Figure 67: pro forma outcome for 8 to 10 units at 1.6 FAR.

1.8 FAR 45% lot coverage	LTV	NPV	IRR
8 units, 4,000sf lot	49.4%	-$1,041,351	5.8%
10 units, 5,000sf lot	54.0%	-$1,134,481	7.9%

Figure 68: pro forma outcome for 8 to 10 units at 1.8 FAR.

Based on these two tests, the proposed buildings would not be built, at least within the typical market. All three metrics are far from reflecting a desirable real estate investment. A more realistic equity to debt ratio would be closer to 20% to 30% equity and 80%debt (Staiger 2018, 94), or an LTV of 70% or 80%. The NPV is well into the negatives, and the IRR is substantially below the 15% which would be desired.

The Red Willow project in Rainier Valley is an example of a middle housing project that was made feasible in part through a lower desired return of only 5%. This return rate was set by the project team and primary investors: Dan Whitmore, builder and passivehouse expert; Wayne Apostolik, cofounder of Triple Bottom Line Construction; and Ginger Segeland, affordable housing professional (Veilleux 2024). 5% is comparable to the ten year treasury yield ("United States Rates & Bonds" 2024), and was set with the intent of making the units more affordable (Veilleux 2024).

5% discount rate & free land	LTV	NPV	IRR
10 units, 5,000sf lot @ 1.6 FAR, 40% lot coverage	64.5%	$1,619,853	13.0%
10 units, 5,000sf lot @ 1.8 FAR, 45% lot coverage	61.0%	$1,450,002	11.2%

Figure 69: pro forma outcome for 10 units with free land.

Testing feasibility with free land and a lower discount rate improves the performance, unsurprisingly. However, the low LTV proportion still makes this scenario unlikely. This persistently low LTV reflects a cash flow that would not be adequate to cover a higher level of debt. Essentially, these buildings do not produce enough income to pay for their own construction.

Due to the limitations of the model, these metrics may not represent a true test of feasibility, but when compared to other projects modeled with the same pro forma, it is fair to say they under perform other, more typical apartment buildings. The following figures will explore these alternatives, along with some theoretical tests that explore general trends in feasibility based on changes to building form and zoning code.

Alternative unit mixes:

As was seen in the survey of existing MPABs, most of the midrise apartments that have been built recently have more, smaller units, usually one bedrooms and studios. Bellow are the results for a point access building with unit counts and sizes closer to a more typical midrise project. While these numbers are am improvement, with higher LTVs and IRRs, they still do not appear to be feasible, at least within this analysis.

2.0 FAR 50% lot coverage	LTV	NPV	IRR
20 units, 4,000sf lot	55.5%	-$922,012	8.5%
20 units, 5,000sf lot	55.5%	-$1,148,288	8.6%

Figure 70: pro forma outcome for 20 units at 2.0 FAR.

In the next test, an existing project was roughly estimated in the model, with the assumptions adjusted to reflect market conditions similar to the time of construction for the project. The poor performance indicates that the model very well may be lacking the necessary sophistication needed, however this test does give a relatively good base line to compare other scenarios too, as has been done in fig 72. Fig 73 shows the slight increase in LTV and IRR as project size increases. The NPVs do not reflect a clear trend.

LR3 zoning no lot coverage max	LTV	NPV	IRR
1.95 FAR 20 units, 4,200sf lot In 2020/21	58.3%	-$897,417	8.4%

Figure 71: pro forma outcome for estimated B9 project at 1823 13th Ave:

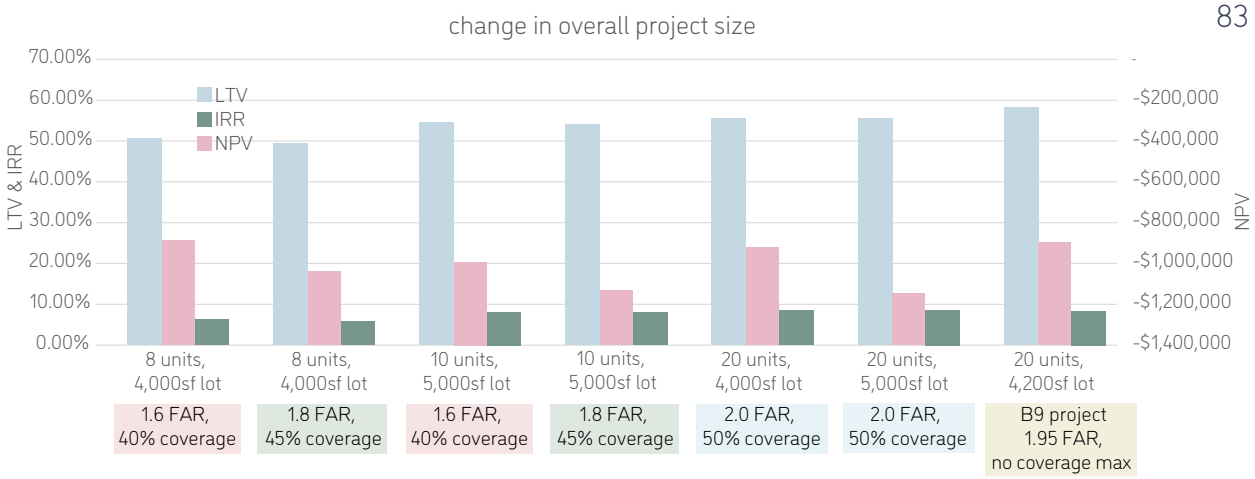


Figure 72: Change in outcome based on Overall Project Size.

Considering the inexactness of this analysis, it is helpful to look at these numbers in relationship to each other rather than as absolutes reflections of project feasibility. The following is a comparison of entirely theoretical projects, in which specific zoning related variables are shifted to compare their different impacts on project feasibility. These artificial datasets are small but they seem to reflect some basic trends that were described by the professionals I spoke with. IRR and LTV generally increase as project size increases (fig 74). The second graph shows an increase as units get larger, but then drops off for units larger than 800sf.
Due to the small data set and inexactness of the model, this may not mean anything but it would be interesting to do a more rigorous analysis of this nature. Other variables such as bedroom count and construction methods would need to be included to give an accurate sense of the trends present in project feasibility.

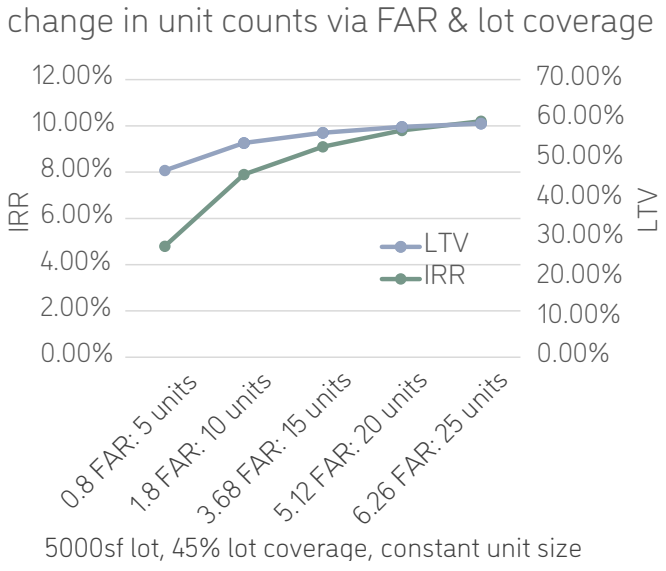


Figure 73: change in unit counts.

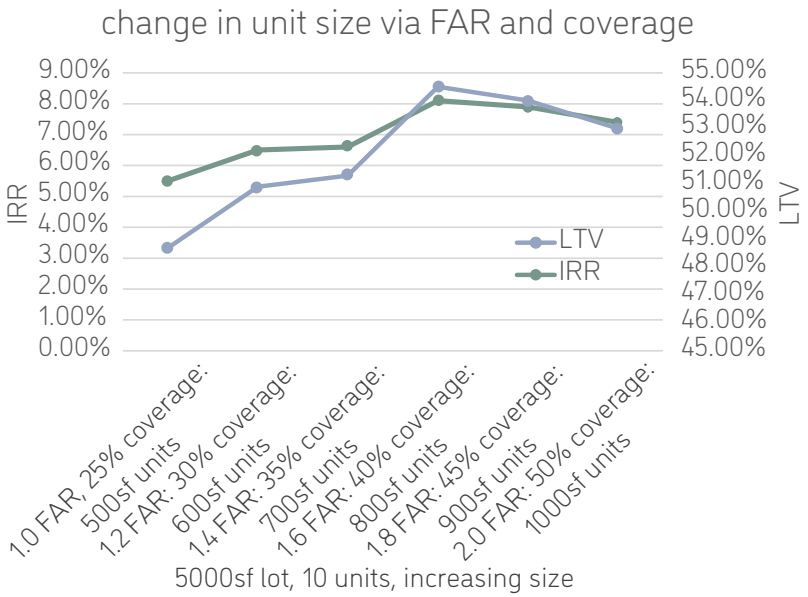


Figure 74: change in unit size.

other cost drivers

This exploration indicates that larger units are more expensive to build, or at least produce lower returns than smaller units. Lower rent per square foot for larger units is a major contributing factor. A study of cost drivers in subsidized housing construction confirms this finding: three and four bedrooms were more expensive to build than one and two bedroom units on a per-unit cost basis. The study also found that smaller projects, as in less total building area, were more expensive to build on a per-unit basis than larger projects (Lubell and Wolff 2018). These trends both negatively impact the feasibility of building family-sized units in midrise, urban infill buildings.

Other major cost barriers to these buildings, beyond general economic trends, are location related. Regional differences in construction costs are related to construction wages, material costs, and differences in construction methods (Lubell and Wolff 2018) (Raetz et al. 2020). Seattle's construction costs are above average when compared to the rest of the country ("RSMeans City Cost Index," n.d.). It is likely that higher wages, higher material costs, and more stringent building codes are all contributing to this; Seattle has high environmental and seismic standards for it's buildings that require more costly methods and materials.

conditions for feasibility

Based on these observations, it would likely require some combination of low-cost land, subsidy, and reduction of regulatory and permitting barriers to substantially increase housing production and lower housing costs. Shortening permitting timelines, and reducing permitting and development fees have all been widely cited as strategies to get more housing built.

Adjusting the strategy may also be required: larger buildings tend to be less expensive to build per unit, which may give them more flexibility to build the larger, family-sized units this project is calling for. Unfortunately, the massing and layout of these buildings provides fewer opportunities to build these larger units, as was discussed in the literature review. Finding ways to fit these units into larger projects, such as utilizing multiple point access conditions on larger lots, along with zoning requirements to build them such as those found within the LR1 zone, may be more successful than saddling the smaller infill projects with their construction.

7. Conclusion

reviewer comments and closing thoughts

I would like to thank my reviewers; Bradley Khouri, principal of B9 Architects; Markus Johnson of MAKERS Architecture and Urban Design; Rico Quirindongo, Director of Seattle's Office of Planning and Community Development; Lesley Bain, Principal and Co-founder of Framework; and Jeff Arango, Principal at Framework, for the insightful feedback and enjoyable conversation. The following is a summary of their comments and my own reflections on this project.

enabling housing diversity

This project started with the goal of creating more family-sized rental housing. This has not, strictly, been the actual outcome of this thesis. Rather, the zone description, architectural studies, and economic investigation all indicate that this zone proposal is really about creating a wide range of unit sizes and types, from rental studios to three bedroom condos. This was pointed out by Bradley as well and several others. Upon reflection, this is an ideal outcome. The ultimate goal and best possible outcome would be a zoning code that promotes a diversity of housing sizes, options, and price points, as originally mentioned at the very beginning of the project, in the planning thesis introduction. We need a diversity of housing to suit the needs of our diverse population.

more condominiums

The economic investigation, as well as the survey of existing MPABs done for the planning thesis both indicate that many of the buildings enabled by the Urban Residential zone are more likely to be built as for-sale units. It was generally agreed that this was the case, but that this was not actually a bad outcome. More condo units could lower the barrier to home ownership in Seattle, which is often brought up in housing conversations as a key to reducing displacement, and creating more housing security. Changing condo laws to reduce the liability for contractors and developers would encourage this outcome.

zone location and transformation over time

The proposed location of the UR zone, as stated in the planning thesis, was questioned by my committee. Why not simply replace all of our NR zoning with this higher density alternative, increasing opportunities for these stacked flats to be built? In my review, I mentioned this as an "ideal" situation. Jeff Arango pushed back on this slightly, reminding us that, as much as we need and want more housing and more density in residential areas, the deepest and most suburban pockets of Seattle often lack the infrastructure necessary to support this density. The interior of many of the city's formerly single-family neighborhoods lack frequent bus service and are not within walking distance of fresh food, stores, restaurants or other amenities. The residents of these areas typically rely on cars to access basic needs and transport the family, as Jeff himself described. Adding density to these areas would, at this time, also add cars.

This did occur to me, to some extent, when considering where the UR zone might go. Framing the UR zone as a way to provide more, relatively affordable, family-sized housing near opportunities and amenities dictated that the zone should probably be in proximity to higher density areas, mixed use zones, and transportation. This contributed to the narrow buffer shown on the map, hopefully translating to a short walk to amenities and transit.

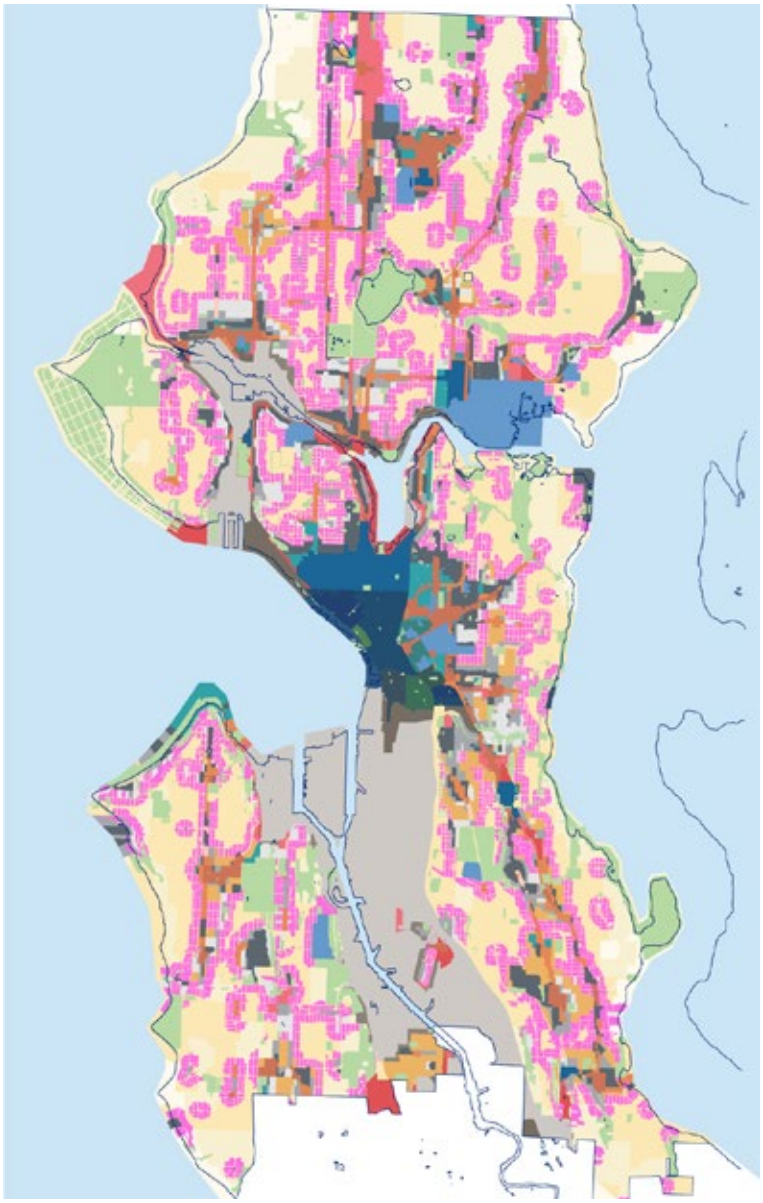


Figure 75: proposed location of UR zone shown in pink.

Comments on the planning thesis regarding larger scale changes to the urban fabric that this zone might incite have made me realize that the question of where to put the UR zone is not an either / or issue. Instead, we can accept the incremental nature of our political process and expand the UR zone as the urban fabric adjusts. In order to catalyze this change though, the initial implementation will need to have a sizable impact, which will put strain on certain systems until they adapt. For example, there will likely be more cars parked on the street when these multifamily buildings are added to a neighborhood. Neighbors and newcomers will need to practice patience as alternative transportation options catch up, and those that might be able to go car free slowly transition to electric bikes and transit passes.

Jeff also acknowledged the trade offs that must be made as a result of our existing urban fabric. It's difficult to find enough space to raise a family, in a location where living without a car is possible. Eventually his family moved into a single-family neighborhood where they had space and a lawn but now they are unable to live car-free. His anecdote illustrates how providing space for families near transit and amenities is necessary to move towards a more environmentally sound society.

context and nuance

I have produced a lot of variation from this single code definition, but the use of a relatively simple, flexible code relies on the market to produce that variation and be sensitive to context. Based on history, this is probably not a good bet. It was suggested that I impose those desired outcomes via the code. However, this could lead to a more complex set of regulations. Regarding variation, it is also possible that the UR zone description has too much emphases on maximizing density. As Lesley brought up, there will still be scenarios in which a simple ADU or a smaller fourplex or sixplex will be the most logical, financially feasible option. The UR zone description should still allow for those possibilities. As it stands, it might be difficult to build a DADU under the UR zoning, which is not something that should be discouraged.

Both Lesley and Bradley brought up the possibility of creating a code that is more sensitive to context by breaking the UR zone into multiple sub-categories. It was generally agreed that the proposed zone is not accounting for the differences in fine grained context these buildings will encounter. Building scale and parking can have very different effects in different parts of the city. As I experienced, it's extremely difficult to write code that accounts for this variation while still being relatively simple. To overcome this, they both suggested that the UR zone could have several different levels similar to our existing NR1, 2, and 3 zones, or have different requirements depending on block context, such as a higher lot coverage for corner lots.

Variations in FAR, lot cover or unit count could be contingent on whether the site is on a corner or mid-block, or on the size of the lot or type of project, as in an ADU. Height limits and front setbacks could be based on adjacent properties, not to entirely conform, but at least to be informed by the immediate context. Several of the design studies presented in this document have been proposed in an area with primarily single story homes. While I'm hesitant to reduce density too much, lower heights in these areas might make sense. In other areas close to transit, or where topography and more redevelopment has produced larger, taller homes, allowing five stories outright might make sense. Under a system of sub-zones, creating space for a wider variety of context-sensitive project types could be easier and more streamlined.

Splitting the code into different levels may also help to simplify things. Rather than having height limits be the same across all lots with the use of bonuses to add space, multiple categories could be created, depending on lot size and unit count, so that smaller lots have lower unit counts and lower height limits, while larger lots have higher unit counts and higher height limits, essentially making the bonuses automatic where they are most needed. Working on these more context sensitive sub-zones would be an interesting Urban Design project.

Lesley also brought up the use of more open space and amenity space to bring some of that context sensitivity to the code. Requiring or incentivizes usable outdoor spaces for children to play, or more ecologically beneficial landscaping could help these buildings be accepted into the neighborhood more easily, especially if usable spaces are accessible to neighbors. Working on these open space requirements and tying this

zone in with existing Green Factor requirements would be an excellent next step for this project.

Realism and adjustments

Other adjustments to the zone that were suggested included increasing the base lot coverage beyond that of my final proposal, and potentially finding ways to make the bellow grade units more equitable or removing them.

The proposed coverage of 10% for each dwelling unit up to 45% needs to be revised. According the Rico, this is not a realistic base lot coverage, and upon reflection I would tend to agree with him. It would make ADUs difficult to build, among other things. Adjusting to 25% for one unit, plus 5% for each additional dwelling unit up to 45% might work better.

It was encouraging to hear from Rico that, while the lot coverage needs some rethinking, the proposed 40 foot height limit is not entirely unrealistic. He mentioned that OPCD is currently discussing similar heights and increased unit densities along transit corridors with the city, as part of the comprehensive plan update.

Another potential adjustment would be the removal or reshaping of the bellow grade incentive. As it stands, the 5 foot height bonus for partially bellow grade stories incentivizes units in these spaces. While using this exempt area for units would allow for larger units in the rest of the building, Brad was concerned that it may introduce equity issues. I am honestly not sure what the right answer is here but it was good feedback and definitely something that I am concerned about. Creating smaller basement units in a building where the above grade units are potentially much larger and nicer is not a desired outcome. This element in the code needs to be further explored and revised to avoid inequitable housing.

financial feasibility

My conclusion that these buildings might be difficult to build for financial reasons was generally confirmed. Jeff mentioned that these larger units might go for a premium, making them more feasible, in some markets, but likely not in Seattle. Brad addressed the mix of unit sizes that were achieved in the architectural studies from an economic standpoint, implying that this mix would actually be beneficial to the feasibility of the projects. He also confirmed that, ultimately, economics will drive the form of these buildings, and that the bonuses in the code need to be financially worth it or they won't happen. Finally, we discussed land cost as a potential means of subsidy, however, Brad also confirmed what my pro forma tests indicate; removing land costs does not make as much of a difference as we might like it to.

Jeff described some of the findings from Framework's own real estate investigations. In some markets, such as Medina, there is a premium on larger units. In more expensive, more suburban markets such as these, it might be more feasible to build larger units than it is in Seattle proper. Families will pay more in these areas

because they often have better schools than Seattle. These markets and larger units favor for-sale models over rentals. Jeff explained that, generally, housing costs about the same to build anywhere within the region, minus land cost. The differences in financial feasibility are often more related to differences in market driven returns rather than differences in costs of construction or cost of financing.

Ultimately this underlines the difficulties of building housing in that a less affordable market will incentivize construction until that added supply stabilizes or brings down prices. Once the market becomes relatively more affordable, construction will slow and supply will drop. As supply drops, prices increase and the cycle repeats. If the cost of development is fundamentally higher than what many people can afford to pay for housing, the market will remain unaffordable for many people.

Unless there is a premium placed on larger units, as described by Jeff, these housing types will be built less frequently. The mix of unit sizes found in many of the architectural examples may help to make these projects more feasible as the smaller units essentially subsidize the larger units. Bradley confirmed this and encouraged a framing for the project that would reflect this unit mix as a positive outcome, rather than the original framing of primarily "family-sized units." As previously discussed, there are other benefits to a mix of unit sizes and types, besides the financial ones. Framing the Urban Residential zone as a means of adding more housing diversity rather than adding family-sized units would be more factual while still reflecting a desired outcome.

These considerations underscore the importance of understanding housing economics when discussing solutions to the housing shortage. Many of Bradley's comments reiterate the importance of understanding economics as a primary driver of building form and housing production. In order to achieve desired outcomes, whether related to over all form or unit size, the incentives in the code must have substantial economic benefits, or developers will have no interest in utilizing them.

For the most part, I believe the bonuses I have added in the code would be beneficial to the bottom line, except for the pitched roof height bonus. If pitched roofs are a desired outcome, which is still up for debate, they will need to be further incentivizes or required. However, keep in mind that their added expense and complexity may reduce housing production if required.

Markus brought up the possibility of removing land cost in order to boost production, and Rico agreed this might be the only realistic way of introducing subsidy for more projects. Unfortunately, as I and Brad acknowledged, this would not help as much as we might think or would want. Bradley confirmed what I observed in my pro forma studies, that "interest rates, construction cost, carrying cost all have a bigger footprint than land cost. It helps, it's another lever..." but it is no silver bullet.

What I draw from all of this is that, unless there is significant systemic change, housing will continue to be expensive to build, and current trends in supply and affordability will likely persist. There is some potential to ease the situation by lowering regulatory barriers such as allowing higher densities, heights and FARs as in

the example of the UR zone, and by shortening and simplifying the entitlement process by speeding up permitting and simplifying or skipping design review. Beyond this, significant change will likely require systemic financial intervention.

To conclude on a somewhat more positive note, I will leave this project with two things in mind. The first is that changing land use regulations can help to increase density and housing production. Removing regulatory barriers will not solve the housing shortage but it is a big step in the right direction. The other point I would like to remind myself of is to stay optimistic and continue to see our city through a designers critical eye. By questioning the status quo and always looking for a better solution, we will continue to make progress in the right direction.

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9. Appendix

land cost data

RedFin

West Seattle

	cost	lot sf	house br	land per sf cost	source
1	$ 579,950	5,000	2	$ 115.99	https://redf.in/YLgpZV
2	$ 750,000	7740	2	$ 96.90	https://redf.in/5oTcN6
3	$ 549,950	5550	2	$ 99.09	https://redf.in/lztIua
4	$ 1,150,000	4580	6	$ 251.09	https://redf.in/tIFE1x
5	$ 695,000	6000	2	$ 115.83	https://redf.in/Grwkok
6	$ 950,000	4960	3	$ 191.53	https://redf.in/ML0l7z
7	$ 4,500,000	8682	22	$ 518.31	https://redf.in/zjA4at
8	$ 860,000	6250	2	$ 137.60	https://redf.in/uWvmlh
9	$ 674,950	3200	2	$ 210.92	https://redf.in/sbloCH
10	$ 889,951	3004	3	$ 296.26	https://redf.in/Y7LNX5
	$ 1,159,980	5496.6	average	$ 203.35	

South Seattle: Mt. Baker, Columbia City, Beacon Hill

	cost	lot sf	house br	land per sf cost	source
1	$ 777,000	4,400	2	$ 176.59	https://redf.in/2pXnN6
2	$ 629,950	5000	2	$ 125.99	https://redf.in/ssc3k2
3	$ 965,000	2500	4	$ 386.00	https://redf.in/yeniQl
4	$ 1,099,000	7200	4	$ 152.64	https://redf.in/YLJE5o
5	$ 1,100,000	4984	4	$ 220.71	https://redf.in/y3Nfp5
6	$ 619,000	2522	3	$ 245.44	https://redf.in/KTJCt1
7	$ 1,800,000	16553		$ 108.74	https://redf.in/F4h2mv
8	$ 650,000	3515	5	$ 184.92	https://redf.in/AVhoAr
9	$ 800,000	4431	vacant	$ 180.55	https://redf.in/klrqRV
10	$ 988,000	6000	4	$ 164.67	https://redf.in/Wf8mrD
	$ 942,795	5710.48	average	$ 194.62	

Central Seattle: CD, Capitol Hill, Madrona

	cost	lot sf	house br	land per sf cost	source
1	$ 915,000	3,090	4	$ 296.12	https://redf.in/3Yz0Fg
2	$ 1,600,000	3600	4	$ 444.44	https://redf.in/qVFG2c
3	$ 930,000	4000	3	$ 232.50	https://redf.in/MAjeZK
4	$ 995,000	2592	4	$ 383.87	https://redf.in/HWRFt1
5	$ 995,000	3366	3	$ 295.60	https://redf.in/3clw68
6	$ 975,000	3000	5	$ 325.00	https://redf.in/qeznlG
7	$ 1,745,000	3268	5	$ 533.97	https://redf.in/ONSknY
8	$ 1,290,000	5590	3	$ 230.77	https://redf.in/xLBXLE
9	$ 1,350,000	4750	3	$ 284.21	https://redf.in/1Nji1k
10	$ 875,500	3605	2	$ 242.86	https://redf.in/VJSGac
	$ 1,167,050	3686.1	average	$ 326.93	

Queen Ann / Magnolia

	cost	lot sf	house br	land per sf cost	source
1	$ 860,000	5,280	3	$ 162.88	https://redf.in/r1hgFa
2	$ 1,075,000	7200	0	$ 149.31	https://redf.in/Ndrruf
3	$ 750,000	6413	1	$ 116.95	https://redf.in/BjNF9v
4	$ 850,000	6004	4	$ 141.57	https://redf.in/1DEwCz
5	$ 1,300,000	8000	1	$ 162.50	https://redf.in/uqpRr7
6	$ 1,286,000	3492	4	$ 368.27	https://redf.in/2COjRf
7	$ 1,998,000	5150	3	$ 387.96	https://redf.in/jpAxAq
8	$ 1,500,000	3144	3	$ 477.10	https://redf.in/5SrJnZ
9	$ 1,150,000	1939	3	$ 593.09	https://redf.in/Mr7pgw
10	$ 1,590,000	5190	3	$ 306.36	https://redf.in/tMeFqT
	$ 1,235,900	5181.2	average	$ 286.60	

property records: king county parcel viewer

West Seattle

	cost as of 2023	lot sf	house br	land per sf cost	parcel number	
1	$ 766,000	5,800	3	$ 132.07	019400-0685	
2	$ 810,000	2025	4	$ 400.00	927570-3395	
3	$ 805,000	2500	3	$ 322.00	632400-0015	
4	$ 869,000	4000	4	$ 217.25	608710-0005	
5	$ 1,101,000	4420	multi	$ 249.10	927420-0075	
6	$ 841,000	6477	3	$ 129.84	927420-3795	
7	$ 190,900	5024	vacant	$ 38.00	789980-0240	
8	$ 307,000	4728	vacant	$ 64.93	789980-0380	
9	$ 3,076,000	14552	multi	$ 211.38	789980-0981	
10	$ 752,000	6314	4	$ 119.10	193230-0125	
	$ 951,790	5584	average	$ 188.37		$ 195.86

South Seattle: Mt. Baker, Columbia City, Beacon Hill

	cost as of 2023	lot sf	house br	land per sf cost	parcel number	
1	$ 303,000	6,390	vacant	$ 47.42	262404-9219	
2	$ 543,000	6000	2	$ 90.50	912200-0970	
3	$ 701,000	5023	4	$ 139.56	333300-2722	
4	$ 1,128,000	6600	3	$ 170.91	170290-0350	
5	$ 438,000	3240	2	$ 135.19	754980-2070	
6	$ 639,000	3911	3	$ 163.39	983470-0195	
7	$ 410,500	2090	0	$ 196.41	170990-0020	
8	$ 1,052,000	2591	3	$ 406.02	066900-0230	
9	$ 585,000	3000	vacant	$ 195.00	027200-0070	
10	$ 526,000	6000	2	$ 87.67	149830-1970	
	$ 632,550	4484.5	average	$ 163.21		$ 178.91

Central Seattle: CD, Capitol Hill, Madrona

	cost as of 2023	lot sf	house br	land per sf cost	parcel number	
1	$ 773,000	6,160	2	$ 125.49	920990-0435	
2	$ 843,000	7200	3	$ 117.08	982820-0580	
3	$ 2,359,000	6820	multi	$ 345.89	118900-0710	
4	$ 723,000	5996	2	$ 120.58	684070-0095	
5	$ 892,000	6660	5	$ 133.93	982920-0910	
6	$ 1,272,000	5400	2	$ 235.56	423240-0700	
7	$ 508,000	3651	vacant	$ 139.14	982920-0835	
8	$ 676,000	3600	4	$ 187.78	125020-1040	
9	$ 708,000	7200	vacant	$ 98.33	125020-1045	
10	$ 672,000	4980	3	$ 134.94	636290-0220	
	$ 942,600	5766.7	average	$ 163.87		$ 245.40

Queen Ann / Magnolia

	cost as of 2023	lot sf	house br	land per sf cost	parcel number	
1	$ 2,109,000	6,050	4	$ 348.60	545780-0121	
2	$ 3,850,000	7000	3	$ 550.00	887300-0030	
3	$ 1,454,000	7200	multi	$ 201.94	186060-0870	
4	$ 1,058,000	3600	3	$ 293.89	186140-0060	
5	$ 1,569,000	6000	3	$ 261.50	277060-4555	
6	$ 812,000	6000	3	$ 135.33	277060-4675	
7	$ 934,000	8250	3	$ 113.21	812770-0425	
8	$ 731,000	7192	2	$ 101.64	812770-0515	
9	$ 1,192,000	8215	2	$ 145.10	812770-0620	
10	$ 2,019,200	10091		$ 200.10	232503-9070	
	$ 1,572,820	6959.8	average	$ 235.13		$ 260.86

RedFin

North East Seattle: Ravenna, Maple Leaf

	cost	lot sf	house br	land per sf cost	source
1	$ 1,250,000	7,499	5	$ 166.69	https://redf.in/7PmqWT
2	$ 765,000	7,140	3	$ 107.14	https://redf.in/TgPnbE
3	$ 985,000	6598	3	$ 149.29	https://redf.in/MmcFcB
4	$ 1,099,000	2252	3	$ 488.01	https://redf.in/HB3Jzq
5	$ 789,900	4794	3	$ 164.77	https://redf.in/JL88gW
6	$ 888,000	2112	5	$ 420.45	https://redf.in/jP3Skv
7	$ 933,000	4480	4	$ 208.26	https://redf.in/2T0SO5
8	$ 850,000	2800	3	$ 303.57	https://redf.in/K3t2Ro
9	$ 848,000	3360	2	$ 252.38	https://redf.in/vuwhSn
10	$ 1,100,000	3959	multi	$ 277.85	https://redf.in/xcGEqV
	$ 950,790	4499.4	average	$ 253.84	

North West Seattle: Ballard, Fremont, Greenwood

	cost	lot sf	house br	land per sf cost	source
1	$ 1,950,000	7,200	multi	$ 270.83	https://redf.in/YqHOrv
2	$ 1,499,500	5000	multi	$ 299.90	https://redf.in/E57SaP
3	$ 699,990	4896	4	$ 142.97	https://redf.in/m6pwaq
4	$ 649,000	5040		$ 128.77	https://redf.in/hq1Zur
5	$ 649,000	3816	3	$ 170.07	https://redf.in/O0v37H
6	$ 949,000	5280	vacant	$ 179.73	https://redf.in/WSULJl
7	$ 898,000	3840	2	$ 233.85	https://redf.in/SZsYlp
8	$ 1,550,000	4875	3	$ 317.95	https://redf.in/skzLFO
9	$ 1,498,000	4080	6	$ 367.16	https://redf.in/uh7XPx
10	$ 1,150,000	3420	1	$ 336.26	https://redf.in/efmyQP
	$ 1,149,249	4744.7	average	$ 244.75	

property records: king county parcel viewer

North East Seattle: Ravenna, Maple Leaf

	cost as of 2023	lot sf	house br	land per sf cost	parcel number	
1	$ 1,157,300	4,120		$ 280.90	881640-0810	
2	$ 682,000	4120	2	$ 165.53	522630-0190	
3	$ 551,000	5402	vacant	$ 102.00	638600-0040	
4	$ 797,000	6989	3	$ 114.04	322604-9215	
5	$ 622,000	7072	3	$ 87.95	042504-9085	
6	$ 734,000	5600	3	$ 131.07	203850-0215	
7	$ 693,000	4080	vacant	$ 169.85	954720-0250	
8	$ 2,843,500	8886	vacant	$ 320.00	179750-0205	
9	$ 910,000	7800	4	$ 116.67	397790-0200	
10	$ 736,000	5730	2	$ 128.45	092504-9039	
	$ 972,580	5979.9	average	$ 161.65		$ 207.74

North West Seattle: Ballard, Fremont, Greenwood

	cost as of 2023	lot sf	house br	land per sf cost	parcel number	
1	$ 1,485,600	3,083	multi	$ 481.87	732190-0220	
2	$ 1,975,000	5000	multi	$ 395.00	569450-1075	
3	$ 1,880,000	8907	3	$ 211.07	397540-0505	
4	$ 496,000	5760	vacant	$ 86.11	292604-9618	
5	$ 1,976,000	10000	5	$ 197.60	755080-0075	
6	$ 1,057,000	4800	4	$ 220.21	123200-0810	
7	$ 711,000	5100	2	$ 139.41	285610-0330	
8	$ 797,000	3956	4	$ 201.47	276760-3470	
9	$ 699,000	4140	4	$ 168.84	291920-1350	
10	$ 777,600	6882	vacant	$ 112.99	643050-0342	
	$ 1,185,420	5762.8	average	$ 221.46		$ 233.10

average land cost per sf across city: $ 220.31

8 units, 1.8 FAR, 45% lot coverage, 4000sf lot

Name/ Address:	relatively inexpensive land, Seattle
Lot Size (sf):	4000

Assumptions			source
Land Cost per sf:	$	220.00	see land tab
Average Rent per sf:	$	3.65	see Unit Mix
Construction Costs per sf:	$	370.00	see Construction Costs
Construction Loan Interest Rate:		6.5%	see Construction Costs
Development Period (months):		12*	Alex
rent increase per year:		3%	educated guessing
Vacancy Rate:		5%	Jeff's proforma
collection loss (unpaid rent):		2%	Jeff's proforma
Pet Rent (per month):	$	25	personal experience
Utilities (monthly):	$	258	
sewer:	$	78	https://www.seattle.gov/uti
water:	$	20	https://www.seattle.gov/utili
trash	$	43	https://www.seattle.gov/utili
electrical:	$	118	https://www.energysage.co
projected inflation:		3.0%	educated guessing
Property Management (% of EGI) :		13%	Alex/ Gregg
Property Tax Rate (% of value):		1%	Jeff's proforma
Repairs & Maintinance (%EGI):		5%	educated guessing
Insurance (% of value):		0.10%	Jeff's proforma
Expected Cap Rate:		5.00%	jeff/

1.60 FAR	5000sf	4000sf	40% lot cov	5000s
built:	10000sf	6400sf	floor plate:	2000s

1.80 FAR	5000sf	4000sf	45% lot cov	5000s
built:	11250sf	7200sf	floor plate:	2250s

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		8
Total Rentable (sf):		6,700
Rent:		
rent per (sf):	$	3.65
total monthly rent:	$	24,450

*note: if development period changes, adjust the draw schedule

Efficiency	
floor plate efficiency:	93.0%
total project (sf):	7,204
FAR:	1.80

note: does not account for below grade units, exterior circulation, etc.

Property Value		
estimated value:	$	3,776,060

(from cash flow analysis, year 1-2) into property taxes and insurance

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	300	1	$ 3.90	$ 1,170
1 br	600		$ 3.80	$ 2,280
2 br	800	3	$ 3.70	$ 2,960
3 br	1,000	4	$ 3.60	$ 3,600
4 br	1,300		$ 3.50	$ 4,550
totals	6,700	8		$ 24,450

(all areas are measured to outside of walls)

floor combo	floor plate area	
2+1	1,400	
3+1	1,600	bike storage, trash room
3+2	1,800	
3+3	2,000	
3+2+SEDU	2,100	

Unit Notes

min SEDU size:	220	150 sf of open floor space
"family sized" per zoning code:	850	
Alex's small 2br:	650	

Land & Development Costs		
Land Cost total:	$	880,000
Hard Costs total:	$	2,665,591
Soft Costs (30%)	$	799,677
Contingency:	$	-
Total	$	4,345,268.82

Financing/ Capital Stack		
Debt Service Ratio		1.251
construction LTV:		49.4%
Construction Loan:	$	2,146,563
Equity:	$	2,198,706
Construction Interest:	$	47,530.76
interest rate:		6.5%
development period:		12 months
Permanent Loan:	$	2,194,094
cost of financing:	$	55,963.82

(a very simple) Draw Schedule		equity	equity+2	Month 3	Month 4
Equity Draws					
beginning balance		$ 2,198,706	$ 1,099,353		
equity draws	2	$ 1,099,353	$ 1,099,353		
ending balance		$ 1,099,353	$ -		
Const. Loan Draws					
Beginning Balance				$ -	$ 19,084
Draw amount				$ 19,084	$ 58,783
Interest Accrual				$ -	$ 103.37
Ending Balance				$ 19,084	$ 77,971

f 4000sf
f 1600sf

f 4000sf
f 1800sf

Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11
$ 77,971	$ 219,407	$ 484,045	$ 869,983	$ 1,309,049	$ 1,699,456	$ 1,972,110
$ 141,014	$ 263,449	$ 383,316	$ 434,354	$ 383,316	$ 263,449	$ 141,014
$ 422.34	$ 1,188.46	$ 2,621.91	$ 4,712.41	$ 7,090.68	$ 9,205.38	$ 10,682.26
$ 219,407	$ 484,045	$ 869,983	$ 1,309,049	$ 1,699,456	$ 1,972,110	$ 2,123,806

Month 12	
$ 2,123,806	
$ 58,783	$ 2,146,563
$ 11,503.95	$ 47,531
$ 2,194,094	

@ first floor

total

assumption summary (from "Project Info & Assumptions")				
rent increase per year:	3%	Property Management:	13%	
vacancy rate:	5%	Property Tax Rate:	1%	
collection loss:	2%	Repairs & Maintinance (%EGI):	5%	
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%	
projected inflation:	3.0%	*assuming 6 months to stabilize		

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 293,400	$ 302,202	$ 311,268	$ 320,606	$ 330,224
Vacancy Loss:	($146,700.00)	($15,110.10)	($15,563.40)	($16,030.31)	($16,511.21)
Collection Loss:	($5,868.00)	($6,044.04)	($6,225.36)	($6,412.12)	($6,604.49)
Net Rental Income:	$ 140,832	$ 281,048	$ 289,479	$ 298,164	$ 307,109
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 266	$ 274	$ 282
Pet Rent:	$ 720	$ 1,440	$ 1,483	$ 1,528	$ 1,574
Total Revenues (EGI)	$ 141,681	$ 282,746	$ 291,229	$ 299,966	$ 308,964

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 18,419	$ 36,757	$ 37,860	$ 38,996	$ 40,165
Utilities:	$ 258	$ 266	$ 274	$ 282	$ 291
Property taxes:	$ 37,761	$ 38,893	$ 40,060	$ 41,262	$ 42,500
Repairs & Maintinance:	$ 7,084	$ 14,137	$ 14,561	$ 14,998	$ 15,448
Insurance:	$ 3,776	$ 3,889	$ 4,006	$ 4,126	$ 4,250
Total Expenses	$ 67,298	$ 93,943	$ 96,762	$ 99,664	$ 102,654
(expenses=1/3 revenue?)	47%	33%	33%	33%	33%

NOI	$ 74,384	$ 188,803	$ 194,467	$ 200,301	$ 206,310
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 1,487,670*	*$ 3,776,060*	*$ 3,889,342*	*$ 4,006,022*	*$ 4,126,203*
DSCR (debt sevice ratio, should b	0.493	1.251	1.288	1.327	1.367

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 2,194,094	
Interest Rate:	5.5%	see construction costs
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 2,194,094	$ 2,163,803	$ 2,131,847	$ 2,098,133	$ 2,062,565
Payment:	($150,965)	($150,965)	($150,965)	($150,965)	($150,965)
Interest:	($120,675)	($119,009)	($117,252)	($115,397)	($113,441)
Principal:	($30,290)	($31,956)	($33,714)	($35,568)	($37,524)
Ending Balance:	$ 2,163,803	$ 2,131,847	$ 2,098,133	$ 2,062,565	$ 2,025,041

Property Net Cash Flow:	*(76,582)*	*37,838*	*43,502*	*49,336*	*55,345*

Equity Investment:	($2,198,706)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($2,275,288)	$37,838	$43,502	$49,336	$55,345

IRR:	5.8%	discount rate if NPV=0

NPV Analysis		
Discount Rate:	15.00%	*desired* return. 15.5% has been suggested to me. try 5% as the "altr
(net present value) NPV:	(1,041,351)	

	year 5	year 6	year 7	year 8	year 9	year 10
	$ 340,131	$ 350,335	$ 360,845	$ 371,670	$ 382,820	$ 394,305
	($17,006.55)	($17,516.75)	($18,042.25)	($18,583.52)	($19,141.02)	($19,715.25)
	($6,802.62)	($7,006.70)	($7,216.90)	($7,433.41)	($7,656.41)	($7,886.10)
	$ 316,322	$ 325,811	$ 335,586	$ 345,653	$ 356,023	$ 366,704
	$ 291	$ 300	$ 309	$ 318	$ 327	$ 337
	$ 1,621	$ 1,669	$ 1,719	$ 1,771	$ 1,824	$ 1,879
	$ 318,233	$ 327,780	$ 337,614	$ 347,742	$ 358,175	$ 368,920

	year 5	year 6	year 7	year 8	year 9	year 10
	$ 41,370	$ 42,611	$ 43,890	$ 45,206	$ 46,563	$ 47,960
	$ 300	$ 309	$ 318	$ 327	$ 337	$ 347
	$ 43,775	$ 45,088	$ 46,441	$ 47,834	$ 49,269	$ 50,747
	$ 15,912	$ 16,389	$ 16,881	$ 17,387	$ 17,909	$ 18,446
	$ 4,377	$ 4,509	$ 4,644	$ 4,783	$ 4,927	$ 5,075
	$ 105,734	$ 108,906	$ 112,173	$ 115,538	$ 119,004	$ 122,575
	33%	33%	33%	33%	33%	33%
	$ 212,499	$ 218,874	$ 225,441	$ 232,204	$ 239,170	$ 246,345
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
	$ 4,249,989	*$ 4,377,489*	*$ 4,508,814*	*$ 4,644,078*	*$ 4,783,400*	*$ 4,926,902*
	1.408	1.450	1.493	1.538	1.584	1.632

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
	$ 2,025,041	$ 1,985,452	$ 1,943,687	$ 1,899,624	$ 1,853,138	$ 1,804,095	$ 1,752,355
	($150,965)	($150,965)	($150,965)	($150,965)	($150,965)	($150,965)	
	($111,377)	($109,200)	($106,903)	($104,479)	($101,923)	($99,225)	
	($39,588)	($41,766)	($44,063)	($46,486)	($49,043)	($51,740)	
	$ 1,985,452	$ 1,943,687	$ 1,899,624	$ 1,853,138	$ 1,804,095	$ 1,752,355	
	61,534	*67,909*	*74,475*	*81,238*	*88,205*	*95,380*	
						$ 4,926,902	
						($1,752,355)	
	$61,534	$67,909	$74,475	$81,238	$88,205	$3,269,927	

10 units, 1.6 FAR, 40% lot coverage, 5000sf lot

1.60 FAR	5000sf	4000sf	40% lot cov	5000sf	4000sf
built:	10000sf	6400sf	floor plate:	2000sf	1600sf

1.80 FAR	5000sf	4000sf	45% lot cov	5000sf	4000sf
built:	11250sf	7200sf	floor plate:	2250sf	1800sf

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		10
Total Rentable (sf):		9,800
Rent:		
rent per (sf):	$	3.61
total monthly rent:	$	35,360

*note: if development peri

Efficiency	
floor plate efficiency:	98.0%
total project (sf):	10,000
FAR:	1.60

note: DOES account for bel

Property Value		
estimated value:	$	5,457,619

(from cash flow analysis, ye

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	300		$ 3.90	$ 1,170
1 br	600		$ 3.80	$ 2,280
2 br	800	1	$ 3.70	$ 2,960
3 br	1,000	9	$ 3.60	$ 3,600
4 br	1,300		$ 3.50	$ 4,550
totals	9,800	10		$ 35,360

Land & Development Costs		
Land Cost total:	$	1,100,000
Hard Costs total:	$	3,700,000
Soft Costs (30%)	$	1,110,000
Contingency:	$	-
Total	$	5,910,000

Financing/ Capital Stack		
Debt Service Ratio		1.251
construction LTV:		52.5%
Construction Loan:	$	3,102,750
Equity:	$	2,807,250
Construction Interest:	$	68,703.36
interest rate:		6.5%
development period:		12 months
Permanent Loan:	$	3,171,453
cost of financing:	$	80,892.93

assumption summary (from "Project Info & Assumptions")				
rent increase per year:	3%	Property Management:	13%	
vacancy rate:	5%	Property Tax Rate:	1%	
collection loss:	2%	Repairs & Maintinance (%EGI):	5%	
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%	
projected inflation:	3.0%	*assuming 6 months to stabilize		

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 424,320	$ 437,050	$ 450,161	$ 463,666	$ 477,576
Vacancy Loss:	($212,160.00)	($21,852.48)	($22,508.05)	($23,183.30)	($23,878.79)
Collection Loss:	($8,486.40)	($8,740.99)	($9,003.22)	($9,273.32)	($9,551.52)
Net Rental Income:	$ 203,674	$ 406,456	$ 418,650	$ 431,209	$ 444,146
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 266	$ 274	$ 282
Pet Rent:	$ 900	$ 1,800	$ 1,854	$ 1,910	$ 1,967
Total Revenues (EGI)	$ 204,703	$ 408,515	$ 420,770	$ 433,393	$ 446,395

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 26,611	$ 53,107	$ 54,700	$ 56,341	$ 58,031
Utilities:	$ 258	$ 266	$ 274	$ 282	$ 291
Property taxes:	$ 54,576	$ 56,213	$ 57,900	$ 59,637	$ 61,426
Repairs & Maintinance:	$ 10,235	$ 20,426	$ 21,038	$ 21,670	$ 22,320
Insurance:	$ 5,458	$ 5,621	$ 5,790	$ 5,964	$ 6,143
Total Expenses	$ 97,139	$ 135,634	$ 139,703	$ 143,894	$ 148,210
(expenses=1/3 revenue?)	47%	33%	33%	33%	33%

NOI	$ 107,564	$ 272,881	$ 281,067	$ 289,499	$ 298,184
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 2,151,282*	*$ 5,457,619*	*$ 5,621,347*	*$ 5,789,988*	*$ 5,963,687*
DSCR (debt sevice ratio, should b	0.493	1.251	1.288	1.327	1.366

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 3,171,453	
Interest Rate:	5.5%	see construction costs
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 3,171,453	$ 3,127,670	$ 3,081,479	$ 3,032,747	$ 2,981,335
Payment:	($218,213)	($218,213)	($218,213)	($218,213)	($218,213)
Interest:	($174,430)	($172,022)	($169,481)	($166,801)	($163,973)
Principal:	($43,783)	($46,191)	($48,732)	($51,412)	($54,240)
Ending Balance:	$ 3,127,670	$ 3,081,479	$ 3,032,747	$ 2,981,335	$ 2,927,096

Property Net Cash Flow:	*(110,649)*	*54,668*	*62,854*	*71,286*	*79,971*

Equity Investment:	($2,807,250)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($2,917,899)	$54,668	$62,854	$71,286	$79,971

IRR:	7.2%	discount rate if NPV=0

NPV Analysis		
Discount Rate:	15.00%	*desired* return. 15.5% has been suggested to me. try 5% as the "altr
(net present value) NPV:	(1,182,940)	

	year 5	year 6	year 7	year 8	year 9	year 10
	$ 491,903	$ 506,660	$ 521,860	$ 537,516	$ 553,641	$ 570,251
	($24,595.16)	($25,333.01)	($26,093.00)	($26,875.79)	($27,682.07)	($28,512.53)
	($9,838.06)	($10,133.21)	($10,437.20)	($10,750.32)	($11,072.83)	($11,405.01)
	$ 457,470	$ 471,194	$ 485,330	$ 499,890	$ 514,886	$ 530,333
	$ 291	$ 300	$ 309	$ 318	$ 327	$ 337
	$ 2,026	$ 2,087	$ 2,149	$ 2,214	$ 2,280	$ 2,349
	$ 459,787	$ 473,580	$ 487,788	$ 502,421	$ 517,494	$ 533,019

	year 5	year 6	year 7	year 8	year 9	year 10
	$ 59,772	$ 61,565	$ 63,412	$ 65,315	$ 67,274	$ 69,292
	$ 300	$ 309	$ 318	$ 327	$ 337	$ 347
	$ 63,269	$ 65,167	$ 67,122	$ 69,135	$ 71,210	$ 73,346
	$ 22,989	$ 23,679	$ 24,389	$ 25,121	$ 25,875	$ 26,651
	$ 6,327	$ 6,517	$ 6,712	$ 6,914	$ 7,121	$ 7,335
	$ 152,657	$ 157,237	$ 161,954	$ 166,812	$ 171,817	$ 176,971
	33%	33%	33%	33%	33%	33%
	$ 307,130	$ 316,344	$ 325,834	$ 335,609	$ 345,677	$ 356,048
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
	$ 6,142,598	*$ 6,326,876*	*$ 6,516,682*	*$ 6,712,183*	*$ 6,913,548*	*$ 7,120,955*
	1.407	1.450	1.493	1.538	1.584	1.632

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
	$ 2,927,096	$ 2,869,873	$ 2,809,503	$ 2,745,812	$ 2,678,619	$ 2,607,730	$ 2,532,942
	($218,213)	($218,213)	($218,213)	($218,213)	($218,213)	($218,213)	
	($160,990)	($157,843)	($154,523)	($151,020)	($147,324)	($143,425)	
	($57,223)	($60,370)	($63,690)	($67,193)	($70,889)	($74,788)	
	$ 2,869,873	$ 2,809,503	$ 2,745,812	$ 2,678,619	$ 2,607,730	$ 2,532,942	
	88,917	*98,131*	*107,621*	*117,396*	*127,464*	*137,835*	
						$ 7,120,955	
						($2,532,942)	
	$88,917	$98,131	$107,621	$117,396	$127,464	$4,725,847	

20 units, 2.0 FAR, 50% lot coverage, 4000sf lot

1.60 FAR	5000sf	4000sf	40% lot cov	5000sf	4000sf
built:	10000sf	6400sf	floor plate:	2000sf	1600sf

1.80 FAR	5000sf	4000sf	45% lot cov	5000sf	4000sf
built:	11250sf	7200sf	floor plate:	2250sf	1800sf

(^ accounts for below ground units)

2.00 FAR	5000sf	4000sf	50% lot cov	5000sf	4000sf
built:	12500sf	10000sf	floor plate:	2500sf	2000sf

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		20
Total Rentable (sf):		9,420
Rent:		
rent per (sf):	$	3.80
total monthly rent:	$	35,826

*note: if development peri

Efficiency	
floor plate efficiency:	94.2%
total project (sf):	10,000
FAR:	2.00

note: DOES account for bel

Property Value	
estimated value:	$ 5,553,304

(from cash flow analysis, y

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	300	1	$ 3.90	$ 1,170
1 br	480	19	$ 3.80	$ 1,824
2 br	700		$ 3.70	$ 2,590
3 br	850		$ 3.60	$ 3,060
4 br	1,000		$ 3.50	$ 3,500
totals	9,420	20		$ 35,826

Land & Development Costs		
Land Cost total:	$	880,000
Hard Costs total:	$	3,700,000
Soft Costs (30%)	$	1,110,000
Contingency:	$	-
Total	$	5,690,000.00

Financing/ Capital Stack		
Debt Service Ratio		1.250
construction LTV:		55.5%
Construction Loan:	$	3,157,950
Equity:	$	2,532,050
Construction Interest:	$	69,925.64
interest rate:		6.5%
development period:		12 months
Permanent Loan:	$	3,227,876
cost of financing:	$	82,332.07

assumption summary (from "Project Info & Assumptions")				
rent increase per year:	3%	Property Management:	13%
vacancy rate:	5%	Property Tax Rate:	1%
collection loss:	2%	Repairs & Maintinance (%EGI):	5%
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%
projected inflation:	3.0%	*assuming 6 months to stabilize	

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 429,912	$ 442,809	$ 456,094	$ 469,776	$ 483,870
Vacancy Loss:	($214,956.00)	($22,140.47)	($22,804.68)	($23,488.82)	($24,193.49)
Collection Loss:	($8,598.24)	($8,856.19)	($9,121.87)	($9,395.53)	($9,677.39)
Net Rental Income:	$ 206,358	$ 411,813	$ 424,167	$ 436,892	$ 449,999
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 266	$ 274	$ 282
Pet Rent:	$ 1,800	$ 3,600	$ 3,708	$ 3,819	$ 3,934
Total Revenues (EGI)	$ 208,287	$ 415,671	$ 428,141	$ 440,985	$ 454,215

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 27,077	$ 54,037	$ 55,658	$ 57,328	$ 59,048
Utilities:	$ 258	$ 266	$ 274	$ 282	$ 291
Property taxes:	$ 55,533	$ 57,199	$ 58,915	$ 60,682	$ 62,503
Repairs & Maintinance:	$ 10,414	$ 20,784	$ 21,407	$ 22,049	$ 22,711
Insurance:	$ 5,553	$ 5,720	$ 5,892	$ 6,068	$ 6,250
Total Expenses	$ 98,836	$ 138,006	$ 142,146	$ 146,410	$ 150,803
(expenses=1/3 revenue?)	47%	33%	33%	33%	33%

NOI	$ 109,451	$ 277,665	$ 285,995	$ 294,575	$ 303,412
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 2,189,011*	*$ 5,553,304*	*$ 5,719,903*	*$ 5,891,501*	*$ 6,068,246*
DSCR (debt sevice ratio, should b	0.493	1.250	1.288	1.326	1.366

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 3,227,876	
Interest Rate:	5.5%	see construction costs
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 3,227,876	$ 3,183,314	$ 3,136,301	$ 3,086,702	$ 3,034,375
Payment:	($222,095)	($222,095)	($222,095)	($222,095)	($222,095)
Interest:	($177,533)	($175,082)	($172,497)	($169,769)	($166,891)
Principal:	($44,562)	($47,013)	($49,599)	($52,327)	($55,205)
Ending Balance:	$ 3,183,314	$ 3,136,301	$ 3,086,702	$ 3,034,375	$ 2,979,171

Property Net Cash Flow:	*(112,645)*	*55,570*	*63,900*	*72,480*	*81,317*

Equity Investment:	($2,532,050)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($2,644,695)	$55,570	$63,900	$72,480	$81,317

IRR:	8.5%	discount rate if NPV=0

NPV Analysis		
Discount Rate:	15.00%	*desired* return. 15.5% has been suggested to me. try 5% as the "altr
(net present value) NPV:	(922,012)	

	year 5	year 6	year 7	year 8	year 9	year 10
$	498,386	$ 513,337	$ 528,738	$ 544,600	$ 560,938	$ 577,766
	($24,919.29)	($25,666.87)	($26,436.88)	($27,229.98)	($28,046.88)	($28,888.29)
	($9,967.72)	($10,266.75)	($10,574.75)	($10,891.99)	($11,218.75)	($11,555.32)
$	463,499	$ 477,404	$ 491,726	$ 506,478	$ 521,672	$ 537,322
$	291	$ 300	$ 309	$ 318	$ 327	$ 337
$	4,052	$ 4,173	$ 4,299	$ 4,428	$ 4,560	$ 4,697
$	467,841	$ 481,877	$ 496,333	$ 511,223	$ 526,560	$ 542,357

	year 5	year 6	year 7	year 8	year 9	year 10
$	60,819	$ 62,644	$ 64,523	$ 66,459	$ 68,453	$ 70,506
$	300	$ 309	$ 318	$ 327	$ 337	$ 347
$	64,378	$ 66,309	$ 68,299	$ 70,348	$ 72,458	$ 74,632
$	23,392	$ 24,094	$ 24,817	$ 25,561	$ 26,328	$ 27,118
$	6,438	$ 6,631	$ 6,830	$ 7,035	$ 7,246	$ 7,463
$	155,327	$ 159,987	$ 164,786	$ 169,730	$ 174,822	$ 180,066
	33%	33%	33%	33%	33%	33%
$	312,515	$ 321,890	$ 331,547	$ 341,493	$ 351,738	$ 362,290
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
$	*6,250,293*	*$ 6,437,802*	*$ 6,630,936*	*$ 6,829,864*	*$ 7,034,760*	*$ 7,245,803*
	1.407	1.449	1.493	1.538	1.584	1.631

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
$	2,979,171	$ 2,920,930	$ 2,859,486	$ 2,794,662	$ 2,726,273	$ 2,654,123	$ 2,578,005
	($222,095)	($222,095)	($222,095)	($222,095)	($222,095)	($222,095)	
	($163,854)	($160,651)	($157,272)	($153,706)	($149,945)	($145,977)	
	($58,241)	($61,444)	($64,824)	($68,389)	($72,150)	($76,118)	
$	2,920,930	$ 2,859,486	$ 2,794,662	$ 2,726,273	$ 2,654,123	$ 2,578,005	
	90,419	*99,795*	*109,452*	*119,398*	*129,643*	*140,195*	
						$ 7,245,803	
						($2,578,005)	
	$90,419	$99,795	$109,452	$119,398	$129,643	$4,807,993	

20 units, 2.0 FAR, 50% lot coverage, 5000sf lot

1.60 FAR	5000sf	4000sf	40% lot cov	5000sf	4000sf
built:	10000sf	6400sf	floor plate:	2000sf	1600sf

1.80 FAR	5000sf	4000sf	45% lot cov	5000sf	4000sf
built:	11250sf	7200sf	floor plate:	2250sf	1800sf

(^ accounts for below ground units)

2.00 FAR	5000sf	4000sf	50% lot cov	5000sf	4000sf
built:	12500sf	10000sf	floor plate:	2500sf	2000sf

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		20
Total Rentable (sf):		12,000
Rent:		
rent per (sf):	$	3.74
total monthly rent:	$	44,910

*note: if development peri

Efficiency	
floor plate efficiency:	96.0%
total project (sf):	12,500
FAR:	2.00

note: DOES account for bel

Property Value		
estimated value:	$	6,949,414

(from cash flow analysis, ye

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	300	1	$ 3.90	$ 1,170
1 br	500	9	$ 3.80	$ 1,900
2 br	720	10	$ 3.70	$ 2,664
3 br	850		$ 3.60	$ 3,060
4 br	1,000		$ 3.50	$ 3,500
totals	12,000	20		$ 44,910

Land & Development Costs		
Land Cost total:	$	1,100,000
Hard Costs total:	$	4,625,000
Soft Costs (30%)	$	1,387,500
Contingency:	$	-
Total	$	7,112,500.00

Financing/ Capital Stack		
Debt Service Ratio		1.252
construction LTV:		55.5%
Construction Loan:	$	3,947,438
Equity:	$	3,165,063
Construction Interest:	$	87,407.05
interest rate:		6.5%
development period:		12 months
Permanent Loan:	$	4,034,845
cost of financing:	$	102,915.09

assumption summary (from "Project Info & Assumptions")				
rent increase per year:	3%	Property Management:	13%	
vacancy rate:	5%	Property Tax Rate:	1%	
collection loss:	2%	Repairs & Maintinance (%EGI):	5%	
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%	
projected inflation:	3.0%	*assuming 6 months to stabilize		

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 538,920	$ 555,088	$ 571,740	$ 588,892	$ 606,559
Vacancy Loss:	($269,460.00)	($27,754.38)	($28,587.01)	($29,444.62)	($30,327.96)
Collection Loss:	($10,778.40)	($11,101.75)	($11,434.80)	($11,777.85)	($12,131.18)
Net Rental Income:	$ 258,682	$ 516,231	$ 531,718	$ 547,670	$ 564,100
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 266	$ 274	$ 282
Pet Rent:	$ 1,800	$ 3,600	$ 3,708	$ 3,819	$ 3,934
Total Revenues (EGI)	$ 260,611	$ 520,090	$ 535,693	$ 551,763	$ 568,316

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 33,879	$ 67,612	$ 69,640	$ 71,729	$ 73,881
Utilities:	$ 258	$ 266	$ 274	$ 282	$ 291
Property taxes:	$ 69,494	$ 71,579	$ 73,726	$ 75,938	$ 78,216
Repairs & Maintinance:	$ 13,031	$ 26,004	$ 26,785	$ 27,588	$ 28,416
Insurance:	$ 6,949	$ 7,158	$ 7,373	$ 7,594	$ 7,822
Total Expenses	$ 123,612	$ 172,619	$ 177,798	$ 183,132	$ 188,626
(expenses=1/3 revenue?)	47%	33%	33%	33%	33%

NOI	$ 136,999	$ 347,471	$ 357,895	$ 368,632	$ 379,691
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 2,739,978*	*$ 6,949,414*	*$ 7,157,896*	*$ 7,372,633*	*$ 7,593,812*
DSCR (debt sevice ratio, should b	0.493	1.252	1.289	1.328	1.368

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 4,034,845	
Interest Rate:	5.5%	see construction costs
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 4,034,845	$ 3,979,142	$ 3,920,376	$ 3,858,377	$ 3,792,969
Payment:	($277,619)	($277,619)	($277,619)	($277,619)	($277,619)
Interest:	($221,916)	($218,853)	($215,621)	($212,211)	($208,613)
Principal:	($55,703)	($58,766)	($61,998)	($65,408)	($69,006)
Ending Balance:	$ 3,979,142	$ 3,920,376	$ 3,858,377	$ 3,792,969	$ 3,723,963

Property Net Cash Flow:	*(140,620)*	*69,852*	*80,276*	*91,013*	*102,072*

Equity Investment:	($3,165,063)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($3,305,683)	$69,852	$80,276	$91,013	$102,072

IRR:	8.6%	discount rate if NPV=0

NPV Analysis		
Discount Rate:	15.00%	*desired* return. 15.5% has been suggested to me.
(net present value) NPV:	(1,148,288)	

	year 5	year 6	year 7	year 8	year 9	year 10
$	624,756	$ 643,499	$ 662,804	$ 682,688	$ 703,168	$ 724,263
	($31,237.80)	($32,174.93)	($33,140.18)	($34,134.39)	($35,158.42)	($36,213.17)
	($12,495.12)	($12,869.97)	($13,256.07)	($13,653.75)	($14,063.37)	($14,485.27)
$	581,023	$ 598,454	$ 616,407	$ 634,900	$ 653,947	$ 673,565
$	291	$ 300	$ 309	$ 318	$ 327	$ 337
$	4,052	$ 4,173	$ 4,299	$ 4,428	$ 4,560	$ 4,697
$	585,366	$ 602,927	$ 621,015	$ 639,645	$ 658,834	$ 678,599

	year 5	year 6	year 7	year 8	year 9	year 10
$	76,098	$ 78,380	$ 80,732	$ 83,154	$ 85,648	$ 88,218
$	300	$ 309	$ 318	$ 327	$ 337	$ 347
$	80,563	$ 82,980	$ 85,469	$ 88,033	$ 90,674	$ 93,394
$	29,268	$ 30,146	$ 31,051	$ 31,982	$ 32,942	$ 33,930
$	8,056	$ 8,298	$ 8,547	$ 8,803	$ 9,067	$ 9,339
$	194,284	$ 200,113	$ 206,116	$ 212,300	$ 218,669	$ 225,229
	33%	33%	33%	33%	33%	33%
$	391,081	$ 402,814	$ 414,898	$ 427,345	$ 440,165	$ 453,370
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
$	*7,821,626*	*$ 8,056,275*	*$ 8,297,963*	*$ 8,546,902*	*$ 8,803,309*	*$ 9,067,409*
	1.409	1.451	1.494	1.539	1.586	1.633

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
$	3,723,963	$ 3,651,162	$ 3,574,357	$ 3,493,328	$ 3,407,842	$ 3,317,654	$ 3,222,506
	($277,619)	($277,619)	($277,619)	($277,619)	($277,619)	($277,619)	
	($204,818)	($200,814)	($196,590)	($192,133)	($187,431)	($182,471)	
	($72,801)	($76,805)	($81,029)	($85,486)	($90,188)	($95,148)	
$	3,651,162	$ 3,574,357	$ 3,493,328	$ 3,407,842	$ 3,317,654	$ 3,222,506	
	113,462	*125,195*	*137,279*	*149,726*	*162,546*	*175,751*	
						$ 9,067,409	
						($3,222,506)	
	$113,462	$125,195	$137,279	$149,726	$162,546	$6,020,654	

10 units, 1.6 FAR, 40% lot coverage, free land

1.60 FAR	5000sf	4000sf	40% lot cov	5000sf	4000sf
built:	10000sf	6400sf	floor plate:	2000sf	1600sf

1.80 FAR	5000sf	4000sf	45% lot cov	5000sf	4000sf
built:	11250sf	7200sf	floor plate:	2250sf	1800sf

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		10
Total Rentable (sf):		9,800
Rent:		
rent per (sf):	$	3.61
total monthly rent:	$	35,360

*note: if development per

Efficiency	
floor plate efficiency:	98.0%
total project (sf):	10,000
FAR:	1.60

note: DOES account for be

Property Value		
estimated value:	$	5,457,619

(from cash flow analysis, y

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	300		$ 3.90	$ 1,170
1 br	600		$ 3.80	$ 2,280
2 br	800	1	$ 3.70	$ 2,960
3 br	1,000	9	$ 3.60	$ 3,600
4 br	1,300		$ 3.50	$ 4,550
totals	9,800	10		$ 35,360

Land & Development Costs		
Land Cost total:	$	-
Hard Costs total:	$	3,700,000
Soft Costs (30%)	$	1,110,000
Contingency:	$	-
Total	$	4,810,000.00

Financing/ Capital Stack		
Debt Service Ratio		1.251
construction LTV:		64.5%
Construction Loan:	$	3,102,450
Equity:	$	1,707,550
Construction Interest:	$	68,696.72
interest rate:		6.5%
development period:		12 months
Permanent Loan:	$	3,171,147
cost of financing:	$	80,885.11

assumption summary (from "Project Info & Assumptions")				
rent increase per year:	3%	Property Management:	13%	
vacancy rate:	5%	Property Tax Rate:	1%	
collection loss:	2%	Repairs & Maintinance (%EGI):	5%	
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%	
projected inflation:	3.0%	*assuming 6 months to stabilize		

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 424,320	$ 437,050	$ 450,161	$ 463,666	$ 477,576
Vacancy Loss:	($212,160.00)	($21,852.48)	($22,508.05)	($23,183.30)	($23,878.79)
Collection Loss:	($8,486.40)	($8,740.99)	($9,003.22)	($9,273.32)	($9,551.52)
Net Rental Income:	$ 203,674	$ 406,456	$ 418,650	$ 431,209	$ 444,146
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 266	$ 274	$ 282
Pet Rent:	$ 900	$ 1,800	$ 1,854	$ 1,910	$ 1,967
Total Revenues (EGI)	$ 204,703	$ 408,515	$ 420,770	$ 433,393	$ 446,395

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 26,611	$ 53,107	$ 54,700	$ 56,341	$ 58,031
Utilities:	$ 258	$ 266	$ 274	$ 282	$ 291
Property taxes:	$ 54,576	$ 56,213	$ 57,900	$ 59,637	$ 61,426
Repairs & Maintinance:	$ 10,235	$ 20,426	$ 21,038	$ 21,670	$ 22,320
Insurance:	$ 5,458	$ 5,621	$ 5,790	$ 5,964	$ 6,143
Total Expenses	$ 97,139	$ 135,634	$ 139,703	$ 143,894	$ 148,210
(expenses=1/3 revenue?)	47%	33%	33%	33%	33%

NOI	$ 107,564	$ 272,881	$ 281,067	$ 289,499	$ 298,184
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 2,151,282*	*$ 5,457,619*	*$ 5,621,347*	*$ 5,789,988*	*$ 5,963,687*
DSCR (debt sevice ratio, should b	0.493	1.251	1.288	1.327	1.367

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 3,171,147	
Interest Rate:	5.5%	see construction costs
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 3,171,147	$ 3,127,368	$ 3,081,181	$ 3,032,454	$ 2,981,047
Payment:	($218,192)	($218,192)	($218,192)	($218,192)	($218,192)
Interest:	($174,413)	($172,005)	($169,465)	($166,785)	($163,958)
Principal:	($43,779)	($46,187)	($48,727)	($51,407)	($54,234)
Ending Balance:	$ 3,127,368	$ 3,081,181	$ 3,032,454	$ 2,981,047	$ 2,926,813

Property Net Cash Flow:	*(110,628)*	*54,689*	*62,875*	*71,307*	*79,992*

Equity Investment:	($1,707,550)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($1,818,178)	$54,689	$62,875	$71,307	$79,992

IRR:	13.0%	discount rate if NPV=0

NPV Analysis			
Discount Rate:	5.00%	*desired* return. 15.5% has been suggested to me.	try 5% as the "altru
(net present value) NPV:	1,619,853		

	year 5	year 6	year 7	year 8	year 9	year 10
$	491,903	$ 506,660	$ 521,860	$ 537,516	$ 553,641	$ 570,251
	($24,595.16)	($25,333.01)	($26,093.00)	($26,875.79)	($27,682.07)	($28,512.53)
	($9,838.06)	($10,133.21)	($10,437.20)	($10,750.32)	($11,072.83)	($11,405.01)
$	457,470	$ 471,194	$ 485,330	$ 499,890	$ 514,886	$ 530,333
$	291	$ 300	$ 309	$ 318	$ 327	$ 337
$	2,026	$ 2,087	$ 2,149	$ 2,214	$ 2,280	$ 2,349
$	459,787	$ 473,580	$ 487,788	$ 502,421	$ 517,494	$ 533,019

	year 5	year 6	year 7	year 8	year 9	year 10
$	59,772	$ 61,565	$ 63,412	$ 65,315	$ 67,274	$ 69,292
$	300	$ 309	$ 318	$ 327	$ 337	$ 347
$	63,269	$ 65,167	$ 67,122	$ 69,135	$ 71,210	$ 73,346
$	22,989	$ 23,679	$ 24,389	$ 25,121	$ 25,875	$ 26,651
$	6,327	$ 6,517	$ 6,712	$ 6,914	$ 7,121	$ 7,335
$	152,657	$ 157,237	$ 161,954	$ 166,812	$ 171,817	$ 176,971
	33%	33%	33%	33%	33%	33%
$	307,130	$ 316,344	$ 325,834	$ 335,609	$ 345,677	$ 356,048
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
$	*6,142,598*	*$ 6,326,876*	*$ 6,516,682*	*$ 6,712,183*	*$ 6,913,548*	*$ 7,120,955*
	1.408	1.450	1.493	1.538	1.584	1.632

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
$	2,926,813	$ 2,869,595	$ 2,809,231	$ 2,745,547	$ 2,678,360	$ 2,607,478	$ 2,532,697
	($218,192)	($218,192)	($218,192)	($218,192)	($218,192)	($218,192)	
	($160,975)	($157,828)	($154,508)	($151,005)	($147,310)	($143,411)	
	($57,217)	($60,364)	($63,684)	($67,187)	($70,882)	($74,781)	
$	2,869,595	$ 2,809,231	$ 2,745,547	$ 2,678,360	$ 2,607,478	$ 2,532,697	
	88,938	*98,152*	*107,642*	*117,417*	*127,485*	*137,856*	
						$ 7,120,955	
						($2,532,697)	
	$88,938	$98,152	$107,642	$117,417	$127,485	$4,726,113	

10 units, 1.8 FAR, 45% lot coverage, free land

1.60 FAR	5000sf	4000sf	40% lot cov	5000sf	4000sf
built:	10000sf	6400sf	floor plate:	2000sf	1600sf

1.80 FAR	5000sf	4000sf	45% lot cov	5000sf	4000sf
built:	11250sf	7200sf	floor plate:	2250sf	1800sf

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		10
Total Rentable (sf):		10,600
Rent:		
rent per (sf):	$	3.55
total monthly rent:	$	37,640

*note: if development peri

Efficiency	
floor plate efficiency:	94.3%
total project (sf):	11,241
FAR:	1.80

note: DOES account for bel

Property Value		
estimated value:	$	5,808,029

(from cash flow analysis, y

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	300		$ 3.90	$ 1,170
1 br	600		$ 3.80	$ 2,280
2 br	800	1	$ 3.70	$ 2,960
3 br	950	4	$ 3.60	$ 3,420
4 br	1,200	5	$ 3.50	$ 4,200
totals	10,600	10		$ 37,640

Land & Development Costs		
Land Cost total:	$	-
Hard Costs total:	$	4,159,067
Soft Costs (30%)	$	1,247,720
Contingency:	$	-
Total	$	5,406,786.85

Financing/ Capital Stack		
Debt Service Ratio		1.252
construction LTV:		61.0%
Construction Loan:	$	3,298,140
Equity:	$	2,108,647
Construction Interest:	$	73,029.83
interest rate:		6.5%
development period:		12 months
Permanent Loan:	$	3,371,170
cost of financing:	$	85,987.01

assumption summary (from "Project Info & Assumptions")				
rent increase per year:	3%	Property Management:	13%
vacancy rate:	5%	Property Tax Rate:	1%
collection loss:	2%	Repairs & Maintinance (%EGI):	5%
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%
projected inflation:	3.0%	*assuming 6 months to stabilize	

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 451,680	$ 465,230	$ 479,187	$ 493,563	$ 508,370
Vacancy Loss:	($225,840.00)	($23,261.52)	($23,959.37)	($24,678.15)	($25,418.49)
Collection Loss:	($9,033.60)	($9,304.61)	($9,583.75)	($9,871.26)	($10,167.40)
Net Rental Income:	$ 216,806	$ 432,664	$ 445,644	$ 459,014	$ 472,784
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 266	$ 274	$ 282
Pet Rent:	$ 900	$ 1,800	$ 1,854	$ 1,910	$ 1,967
Total Revenues (EGI)	$ 217,836	$ 434,723	$ 447,764	$ 461,197	$ 475,033

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 28,319	$ 56,514	$ 58,209	$ 59,956	$ 61,754
Utilities:	$ 258	$ 266	$ 274	$ 282	$ 291
Property taxes:	$ 58,080	$ 59,823	$ 61,617	$ 63,466	$ 65,370
Repairs & Maintinance:	$ 10,892	$ 21,736	$ 22,388	$ 23,060	$ 23,752
Insurance:	$ 5,808	$ 5,982	$ 6,162	$ 6,347	$ 6,537
Total Expenses	$ 103,357	$ 144,321	$ 148,651	$ 153,110	$ 157,704
(expenses=1/3 revenue?)	47%	33%	33%	33%	33%

NOI	$ 114,478	$ 290,401	$ 299,114	$ 308,087	$ 317,330
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 2,289,569*	*$ 5,808,029*	*$ 5,982,270*	*$ 6,161,738*	*$ 6,346,590*
DSCR (debt sevice ratio, should b	0.494	1.252	1.290	1.328	1.368

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 3,371,170	
Interest Rate:	5.5%	see construction costs
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 3,371,170	$ 3,324,629	$ 3,275,529	$ 3,223,729	$ 3,169,079
Payment:	($231,955)	($231,955)	($231,955)	($231,955)	($231,955)
Interest:	($185,414)	($182,855)	($180,154)	($177,305)	($174,299)
Principal:	($46,540)	($49,100)	($51,801)	($54,650)	($57,655)
Ending Balance:	$ 3,324,629	$ 3,275,529	$ 3,223,729	$ 3,169,079	$ 3,111,424

Property Net Cash Flow:	*(117,476)*	*58,447*	*67,159*	*76,132*	*85,375*

Equity Investment:	($2,108,647)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($2,226,123)	$58,447	$67,159	$76,132	$85,375

IRR:	11.2%	discount rate if NPV=0

NPV Analysis		
Discount Rate:	5.00%	*desired* return. 15.5% has been suggested to me. try 5% as the "altru
(net present value) NPV:	1,450,002	

	year 5	year 6	year 7	year 8	year 9	year 10
$	523,621	$ 539,330	$ 555,509	$ 572,175	$ 589,340	$ 607,020
	($26,181.05)	($26,966.48)	($27,775.47)	($28,608.74)	($29,467.00)	($30,351.01)
	($10,472.42)	($10,786.59)	($11,110.19)	($11,443.49)	($11,786.80)	($12,140.40)
$	486,967	$ 501,576	$ 516,624	$ 532,122	$ 548,086	$ 564,529
$	291	$ 300	$ 309	$ 318	$ 327	$ 337
$	2,026	$ 2,087	$ 2,149	$ 2,214	$ 2,280	$ 2,349
$	489,284	$ 503,963	$ 519,082	$ 534,654	$ 550,694	$ 567,214

	year 5	year 6	year 7	year 8	year 9	year 10
$	63,607	$ 65,515	$ 67,481	$ 69,505	$ 71,590	$ 73,738
$	300	$ 309	$ 318	$ 327	$ 337	$ 347
$	67,331	$ 69,351	$ 71,431	$ 73,574	$ 75,782	$ 78,055
$	24,464	$ 25,198	$ 25,954	$ 26,733	$ 27,535	$ 28,361
$	6,733	$ 6,935	$ 7,143	$ 7,357	$ 7,578	$ 7,806
$	162,435	$ 167,308	$ 172,327	$ 177,497	$ 182,822	$ 188,306
	33%	33%	33%	33%	33%	33%
$	326,849	$ 336,655	$ 346,755	$ 357,157	$ 367,872	$ 378,908
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
$	*6,536,988*	*$ 6,733,098*	*$ 6,935,091*	*$ 7,143,143*	*$ 7,357,438*	*$ 7,578,161*
	1.409	1.451	1.495	1.540	1.586	1.634

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
$	3,111,424	$ 3,050,598	$ 2,986,426	$ 2,918,725	$ 2,847,300	$ 2,771,947	$ 2,692,449
	($231,955)	($231,955)	($231,955)	($231,955)	($231,955)	($231,955)	
	($171,128)	($167,783)	($164,253)	($160,530)	($156,601)	($152,457)	
	($60,826)	($64,172)	($67,701)	($71,425)	($75,353)	($79,498)	
$	3,050,598	$ 2,986,426	$ 2,918,725	$ 2,847,300	$ 2,771,947	$ 2,692,449	
	94,895	*104,700*	*114,800*	*125,203*	*135,917*	*146,953*	
						$ 7,578,161	
						($2,692,449)	
	$94,895	$104,700	$114,800	$125,203	$135,917	$5,032,665	

approximation of B9 project at 1823 13th Ave

1.60 FAR	5000sf	4000sf	40% lot cov	5000sf	4000sf
built:	10000sf	6400sf	floor plate:	2000sf	1600sf

1.95 FAR	4200sf	45% lot cov	4200sf	
built:	10080sf	floor plate:	1890sf	

(^ accounts for below ground units)

Unit Mix & Rent		
unit count:		20
Total Rentable (sf):		7,270
Rent:		
rent per (sf):	$	3.86
total monthly rent:	$	28,094

*note: if development per

Efficiency	
floor plate efficiency:	72.2%
total project (sf):	10,069
FAR:	1.95

note: DOES account for be

Property Value		
estimated value:	$	4,432,836

(from cash flow analysis, y

Unit Mix	sq ft	count	cost per sf	unit rent
studio/SEDU	312	15	$ 3.90	$ 1,217
1 br	518	5	$ 3.80	$ 1,968
2 br	800		$ 3.70	$ 2,960
3 br	950		$ 3.60	$ 3,420
4 br	1,200		$ 3.50	$ 4,200
totals	7,270	20		$ 28,094

Land & Development Costs		
Land Cost total:	$	1,029,000
Hard Costs total:	$	3,725,623
Soft Costs (30%)	$	1,117,687
Contingency:	$	-
Total	$	5,872,310.25

Financing/ Capital Stack		
Debt Service Ratio		1.252
construction LTV:		58.3%
Construction Loan:	$	3,423,557
Equity:	$	2,448,753
Construction Interest:	$	46,458.97
interest rate:		4.0%
development period:		12 months
Permanent Loan:	$	3,470,016
cost of financing:	$	74,582.84

assumption summary (from "Project Info & Assumptions")			
rent increase per year:	5%	Property Management:	13%
vacancy rate:	5%	Property Tax Rate:	1%
collection loss:	2%	Repairs & Maintinance (%EGI):	5%
Utilities (monthly):	$ 258	Insurance (% of value):	0.10%
projected inflation:	5.0%	*assuming 6 months to stabilize	

OPERATIONS

Revenues	year 0	year 1	year 2	year 3	year 4
Rent					
GPR (gross potential rent):	$ 337,128	$ 353,984	$ 371,684	$ 390,268	$ 409,781
Vacancy Loss:	($168,564.00)	($17,699.22)	($18,584.18)	($19,513.39)	($20,489.06)
Collection Loss:	($6,742.56)	($7,079.69)	($7,433.67)	($7,805.36)	($8,195.62)
Net Rental Income:	$ 161,821	$ 329,205	$ 345,666	$ 362,949	$ 381,097
Other Revenues					
Utility Reimbursement:	$ 129.20	$ 258	$ 271	$ 285	$ 299
Pet Rent:	$ 1,800	$ 3,600	$ 3,780	$ 3,969	$ 4,167
Total Revenues (EGI)	$ 163,751	$ 333,064	$ 349,717	$ 367,203	$ 385,563

Expenses	year 0	year 1	year 2	year 3	year 4
Management (% of EGI):	$ 21,288	$ 43,298	$ 45,463	$ 47,736	$ 50,123
Utilities:	$ 258	$ 271	$ 285	$ 299	$ 314
Property taxes:	$ 44,328	$ 46,545	$ 48,872	$ 51,316	$ 53,881
Repairs & Maintinance:	$ 8,188	$ 16,653	$ 17,486	$ 18,360	$ 19,278
Insurance:	$ 4,433	$ 4,654	$ 4,887	$ 5,132	$ 5,388
Total Expenses	$ 78,495	$ 111,422	$ 116,993	$ 122,843	$ 128,985
(expenses=1/3 revenue?)	48%	33%	33%	33%	33%

NOI	$ 85,256	$ 221,642	$ 232,724	$ 244,360	$ 256,578
Expected Cap Rate	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
Implied Value	*$ 1,705,119*	*$ 4,432,836*	*$ 4,654,478*	*$ 4,887,202*	*$ 5,131,562*
DSCR (debt sevice ratio, should b	0.482	1.252	1.315	1.380	1.449

DEBT SERVICE

Perminant Loan		
Loan Value:	$ 3,470,016	
Interest Rate:	3.0%	https://www.freddiemac.com/pmms as of 2021
Amortization Period:	30	

Loan Payment Schedule	year 0	year 1	year 2	year 3	year 4
Beginning Balance:	$ 3,470,016	$ 3,397,079	$ 3,321,953	$ 3,244,574	$ 3,164,874
Payment:	($177,038)	($177,038)	($177,038)	($177,038)	($177,038)
Interest:	($104,100)	($101,912)	($99,659)	($97,337)	($94,946)
Principal:	($72,937)	($75,125)	($77,379)	($79,700)	($82,091)
Ending Balance:	$ 3,397,079	$ 3,321,953	$ 3,244,574	$ 3,164,874	$ 3,082,783

Property Net Cash Flow:	*(91,782)*	*44,604*	*55,686*	*67,322*	*79,540*

Equity Investment:	($2,448,753)				
Sale Proceeds:					
Mortgage Payoff:					
Total Investor Cash Flow:	($2,540,535)	$44,604	$55,686	$67,322	$79,540

IRR: 8.4% discount rate if NPV=0

NPV Analysis		
Discount Rate:	15.00%	*desired* return. 15.5% has been suggested to me. try 5% as the "altru
(net present value) NPV:	(897,417)	

	year 5	year 6	year 7	year 8	year 9	year 10
$	430,270	$ 451,784	$ 474,373	$ 498,092	$ 522,996	$ 549,146
	($21,513.51)	($22,589.19)	($23,718.65)	($24,904.58)	($26,149.81)	($27,457.30)
	($8,605.41)	($9,035.68)	($9,487.46)	($9,961.83)	($10,459.92)	($10,982.92)
$	400,151	$ 420,159	$ 441,167	$ 463,225	$ 486,386	$ 510,706
$	314	$ 330	$ 346	$ 364	$ 382	$ 401
$	4,376	$ 4,595	$ 4,824	$ 5,066	$ 5,319	$ 5,585
$	404,841	$ 425,083	$ 446,337	$ 468,654	$ 492,087	$ 516,691

	year 5	year 6	year 7	year 8	year 9	year 10
$	52,629	$ 55,261	$ 58,024	$ 60,925	$ 63,971	$ 67,170
$	330	$ 346	$ 364	$ 382	$ 401	$ 421
$	56,575	$ 59,404	$ 62,374	$ 65,493	$ 68,768	$ 72,206
$	20,242	$ 21,254	$ 22,317	$ 23,433	$ 24,604	$ 25,835
$	5,658	$ 5,940	$ 6,237	$ 6,549	$ 6,877	$ 7,221
$	135,434	$ 142,206	$ 149,316	$ 156,782	$ 164,621	$ 172,852
	33%	33%	33%	33%	33%	33%
$	269,407	$ 282,877	$ 297,021	$ 311,872	$ 327,466	$ 343,839
	5.00%	*5.00%*	*5.00%*	*5.00%*	*5.00%*	*5.00%*
$	*5,388,140*	*$ 5,657,547*	*$ 5,940,425*	*$ 6,237,446*	*$ 6,549,318*	*$ 6,876,784*
	1.522	1.598	1.678	1.762	1.850	1.942

	year 5	year 6	year 7	year 8	year 9	year 10	year 11
$	3,082,783	$ 2,998,228	$ 2,911,138	$ 2,821,434	$ 2,729,039	$ 2,633,873	$ 2,535,852
	($177,038)	($177,038)	($177,038)	($177,038)	($177,038)	($177,038)	
	($92,483)	($89,947)	($87,334)	($84,643)	($81,871)	($79,016)	
	($84,554)	($87,091)	($89,704)	($92,395)	($95,166)	($98,021)	
$	2,998,228	$ 2,911,138	$ 2,821,434	$ 2,729,039	$ 2,633,873	$ 2,535,852	
	92,369	*105,840*	*119,984*	*134,835*	*150,428*	*166,802*	
						$ 6,876,784	
						($2,535,852)	
	$92,369	$105,840	$119,984	$134,835	$150,428	$4,507,734	