

How We Grow

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Abstract

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Seattle is one of the fastest growing cities in the nation. It is critical that growth is handled in a way that does not detract from but rather supports the livability, walkability and sense of community in Seattle neighborhoods. Right now buildings are built in a way that addresses an immediate need for density. While accommodating density is important, the ramifications density has on space and form must be considered. An alternative growth model is needed. This model must be flexible, spatially integrated, and developed incrementally over time.

Two significant variables must be looked at to achieve this alternative growth model; form and use. From a diverse range of individual immediate needs are reactions and response to how space is used. These responses are not prescribed and absolute but rather derived by the distinct character structure and form used to shape a space. There is a reciprocal relationship between user and space as each influence the other. Polyvalent spaces are those which may be fixed but can take on many functions as defined by

form and need. Environment, season, time-of-day, demographics, opinion and personal preference are just a few external variables that determine how a single space is used. The second set of variables are constructed. Form, structure, scale, hierarchy, materiality, and texture all have influence on spatial use. Through polyvalent design, these constructed variables offer guidance and cues but do not impose definitive constraint. Too often the built environment segregates function through constructed constraints. This explicit segregation of function has negatively impacted sustainability, community, and affordability in the urban environment.

This thesis explores the gradient that transverses the urban village edge. The design study analyzes several scales: neighborhood transect, block, courtyard and building. Specific spatial and programmatic overlaps exist among each. The intent is to design an incremental alternative growth model focused on form and use. This model must allow for sustainable urban village growth and accommodate several scales of community.

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**HOW
WE
GROW**

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Analysis

01

The following section is an initial look at growth in Seattle. This initial analysis identifies key factors of growth as well as plans, guidelines and models currently being used to support growth. To look at this more in depth a site has been chosen. The site will be along the urban village seam and will be used throughout the thesis as a tool to study, identify and propose solutions to the complex problem of accommodating sustainable growth.

Current Growth

Walking around Seattle today, the signs of growth are all too apparent. A glance at the skyline highlights new towers and a dozen or more cranes. Seattle has been one of the fastest growing cities in the nation for quite some time. According to the latest U.S. census data, Seattle has a 3.1% growth rate.¹ In addition, Seattle has added over 220,000 jobs in the past decade. According to its comprehensive plan, Seattle is projected to add 84,000 more jobs, and 47,000 households by 2024.²

The American suburban experiment of white-picket fence, backyard living is drawing to a close. Cities, for near half a century were thought of as crime-bearing, dirty, unsafe, and congested places. Now, Seattle, and cities like it, are seen as innovation centers, culture centers, and simply great places to live, work, and play. Much of cities growth can be attributed to “bright flight,” the move of primarily tech-employed college educated, millennials back to the city. This is especially noticeable in Seattle. From 2010 to 2017, Seattle-based company Amazon went from 5,000 employees to 40,000 employees.³

However, the millennial move to the city is not solely based on employment. In fact a study by Columbia professor Vishaan Chakrabarti found that over 62% of millennials choose to live in mixed-use urban centers regardless of immediate job availability.⁴ In addition a study conducted by Smart Growth America looked at

500 companies that moved between 2010 to 2015. They found that a majority of these companies chose to move to downtown, urban, walkable neighborhoods. The primary reason to do so was to attract and recruit young millennial talent.⁵ This means that the “Amazon effect” is only part of the growth equation. Though hard to quantify, what may contribute more to growth is a city or neighborhood’s character, urban expression, and overall walkability.

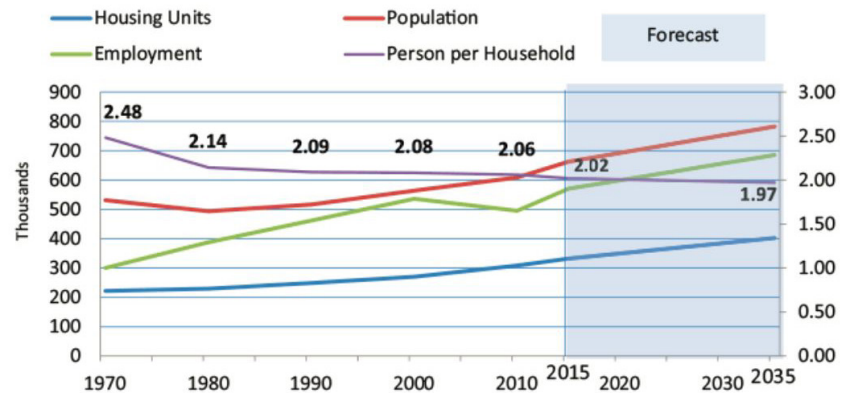


Fig. 1 - Seattle Population Growth, City of Seattle

- 1 United States Census Bureau, “Seattle City, Washington; United States,” Census.gov, July 1, 2016. <https://www.census.gov/quickfacts/fact/table/seattlecitywashington,US/PST045216>.
- 2 City of Seattle Department of Planning and Development, “City of Seattle Comprehensive Plan.” December, 2015.
- 3 Angel Gonzalez and Mike Rosenberg, “Thanks to Amazon Seattle is now America’s Biggest Company Town,” *The Seattle Times*, August 23, 2018. <https://www.seattletimes.com/business/amazon/thanks-to-amazon-seattle-is-now-americas-biggest-company-town/>.
- 4 Vishaan Chakrabarti, *A Country of Cities: A Manifesto for an Urban America* (New York: Metropolis Books, May 30, 2013).

Current Density Model

Since 1994 Seattle has been managing growth by using the Urban Village Strategy. This strategy has sought to create density in specific designated neighborhood centers around Seattle. The strategy divides these urban villages into categories of “Hub Urban Village,” “Residential Urban Village,” and “Urban Center.”⁶

The urban village strategy has allowed single family homes to be left relatively untouched and unaffected by growth. For the past 24 years this strategy has been effective in accommodating density. However, the city has become relatively limited to two different extremes: low density single family homes, and high density concentration in urban villages.

High concentration has been recently defined and characterized by the 5-over-1 and 5-over-2 models. The 5-over-1 and 5-over-2 models consist of 5 stories of light wood frame residential situated above 1 to 2 stories of concrete commercial. A more diverse housing stock is needed. A housing stock that ranges between the 5-over-2 model and the single family home.

The urban village strategy has shaped Seattle for near a quarter century, but is it time for it to evolve? Is there a way to more efficiently utilize space and urban form, and in doing so, manage growth in a more sustainable way?

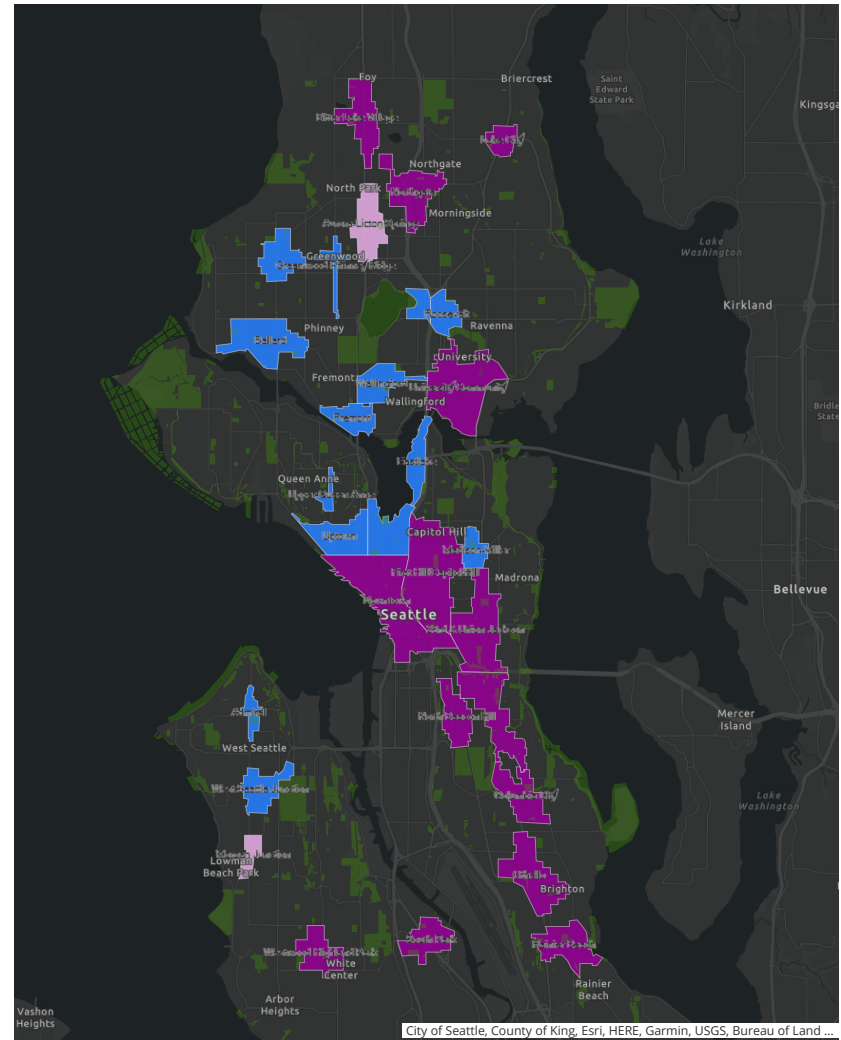


Fig. 2 - Seattle Urban Village Map, City of Seattle

- 5 Smart Growth America, “Core Values: Why American Companies are Moving Downtown,” June 18, 2015.
- 6 City of Seattle Department of Planning and Development. “City of Seattle Comprehensive Plan.”

Ballard

Out of all the Seattle urban villages, Ballard is expected to see the most growth. According to Seattle's 2035 comprehensive plan, Ballard is expected to see an increase of 60% population with a 50% job growth rate.⁷

Ballard has been a strong industrial and manufacturing district for the better half of the last century. Specific industries have included agricultural, timber, maritime, auto, and most recently brewing. Just as there is a strong desire to protect single family homes in the broader Ballard residential areas, there is also a strong desire to preserve and protect industrial zoned land.⁸ Ballard was once a strong working-class and middle-class neighborhood, however increased housing prices due to growth are making it less affordable.

In 2010 the median value home in Ballard was \$361,992 and the median household income was \$69,554. In comparison, according to Zillow, the median value home in Ballard is currently \$792,100.⁹ This is a 16.1% increase in the past year and an 118.8% increase in the past 8 years. Ballard benefits from its ease of access to important public services and is a very self sufficient community, albeit an increasingly less affordable neighborhood.

Ballard is an ideal neighborhood to study growth and change for several reasons:

1. There is a fragile balance between density and community
2. There will be extensive expansion and zoning changes
3. There is a need for missing middle housing and rethinking of density distribution
4. The introduction of light rail service and its affect on pedestrian foot traffic
5. A transition is occurring from a car-oriented community to a pedestrian oriented community

7 Ibid.

8 Seattle Municipal Archives, "Ballard," Seattle.gov, Accessed March 16, 2018. <https://www.seattle.gov/cityarchives/exhibits-and-education/online-exhibits/annexed-cities/ballard>.

9 Zillow, "Ballard Home Prices & Values," Accessed June 6, 2018. <https://www.zillow.com/ballard-seattle-wa/home-values/>.

Ballard Development

To better manage development in Ballard, initiatives and plans have been made apart from the 2035 comprehensive plan. A group of residents and community organizations have come together to form the Ballard Partnership for Smart Growth. This partnership has outlined a framework to help guide development and convey residents primary concerns on growth in the area. The heart of the Ballard Urban Village lies along Market Street between 28th Avenue and 17th Avenue and its continued development is a primary concern of Smart Growth.¹⁰

Over the past decade, West Ballard has become a vibrant commercial and pedestrian oriented environment. However, Ballard has been left largely undefined with services that are still very much auto-oriented. The 5-over-2 has been the primary recent development model in the Ballard Urban Village Hub. According to the Ballard Partnership for Smart Growth, there is strong concern from residents that the current 5-over-2 high density development in Ballard does not contribute to, and in fact detracts from, Ballard's unique character. Another concern with the 5-over-2 model in Ballard has been that ground floor retail has been left vacant in far too many

instances.

The list of Ballard Partnership for Smart Growth's principle concerns are as follows:

- Support a vibrant downtown Ballard business district
- Create a hierarchy of great streets and public spaces, with special attention to Market Street, and preserve green spaces.
- Expand the diversity of jobs to include more office, skilled manufacturing, industrial, and technical jobs.
- Protect and support Ballards thriving industries while insuring appropriate balance between maritime/industrial, retail and restaurants.
- Coordinate infrastructure projects to support existing and new businesses and residents, increase waterfront access, improve multi-modal mobility, and steward public investments.
- Preserve the historic character of the neighborhood.
- Provide design guidance for areas that are likely to change, encouraging quality and variety.
- Balance the mobility needs of pedestrians, bicycles, transit, cars, and freight.
- Prepare for potential light rail investment.
- Support affordable housing.
- Embrace community equity, health, and sustainability as fundamental planning philosophies.

¹⁰ Sustainable Ballard, "Ballard Partnership for Smart Growth," Accessed March 2, 2018. <http://www.sustainableballard.org/ballard-partnership-for-smart-growth/>.

Zoning & Land Use

Subject to further approval, Seattle will move to adopt the “preferred alternative plan.” In order to promote and support affordable housing, Mandatory Housing Affordability (MHA) was established by the Housing Affordability and Livability Agenda (HALA). MHA is a framework that essentially determines where different parts of the city will be up-zoned. In order to do this an Environmental Impact Study (EIS) was needed. The EIS required that several alternative plans must be studied before MHA up-zoning could occur.¹¹ After a long, extensive process with many meetings and community engagement, the preferred alternative plan was created.

This plan not only calls for up-zoning within urban villages, but also expansion of certain urban village boundaries. Figures 3 and 4 show the current zoning and proposed zoning in East Ballard respectively. In Figure 3 the stark contrast and limited separation of space between single family and neighborhood commercial zoning can be seen. Figure 4 presents the urban village expansion with zoning that establishes a much more thorough gradient.

Figure 5 shows Seattle’s future land use map as provided by the 2035 Comprehensive Plan.¹² This map does not take into account the Ballard expansion. It can be seen that the two most dominant land uses are “Hub Urban Village” in blue, and “Single-family Residential” in light beige. There is a significant lack of “Multi-Family Residential,” yellow. Situated between Salmon Bay and the Ballard Hub Urban Village is a large portion of land dedicated to industrial use shown in gray.

11 Seattle Housing and Affordability Living Agenda, “Mandatory Housing Affordability (MHA),” Seattle.gov, Accessed March 9 2018. [http://www.seattle.gov/hala/about/mandatory-housing-affordability-\(mha\)](http://www.seattle.gov/hala/about/mandatory-housing-affordability-(mha)).
 12 City of Seattle Department of Planning and Development. “City of Seattle Comprehensive Plan.”

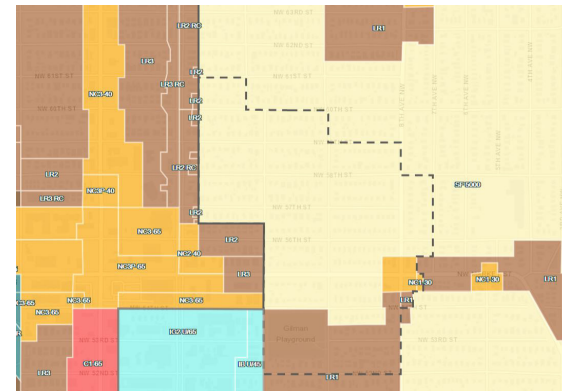


Fig. 3 - Current Zoning, City of Seattle

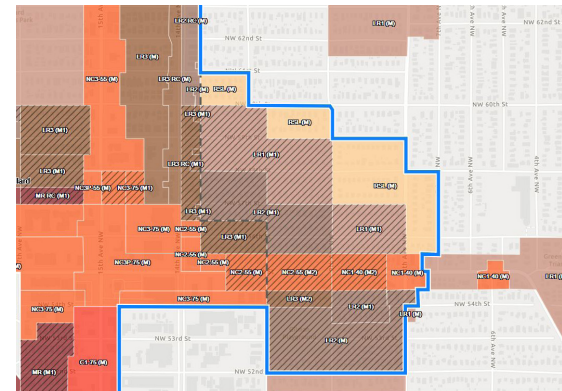


Fig. 4 - MHA Future Zoning, City of Seattle

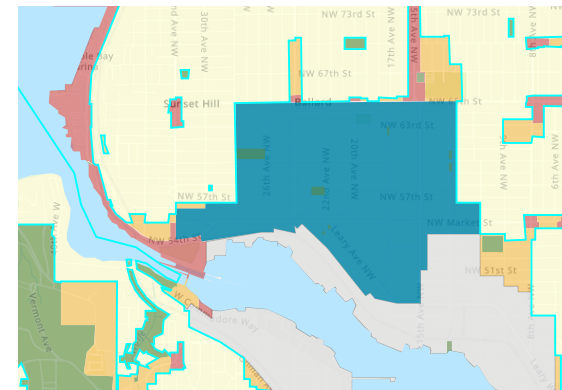


Fig. 5 - 2015 Future Land Use Map, City of Seattle

Transit

From Capitol Hill it takes roughly 50 minutes by bus with two transfers in order to get to Ballard. In comparison, it only takes 15 minutes by car. Ballard is in dire need of a better mass transit connection. To accomplish this, Sound Transit proposed Sound Transit 3 (ST3).

ST3 plans to provide link light rail service to Ballard by 2035. Discussion on how and where ST3 stations will be implemented are being discussed now. The current proposed location for the Ballard station is in the general vicinity of 15th Ave and Market St. in East Ballard. This is just due west of the proposed Ballard expansion. The current plan involves an elevated rail that runs N/S parallel to 15th Ave. The total ridership projected from Market St. to Downtown would be between 22,000 and 26,000.¹³

A link light rail station in Ballard means better access to downtown, and better access to the city as a whole. This also works inversely as Ballard will become more accessible itself. A higher degree of access to Ballard correlates with a higher degree of growth to Ballard. It also means there will be more people on foot.

How this station is implemented is very important. Though it will increase foot traffic, an elevated station might cut off the east side of Ballard from the west. A preferred, although more costly option, would be an underground station. An at grade station is simply not an option as it has been proven to cause too much risk to pedestrian safety.

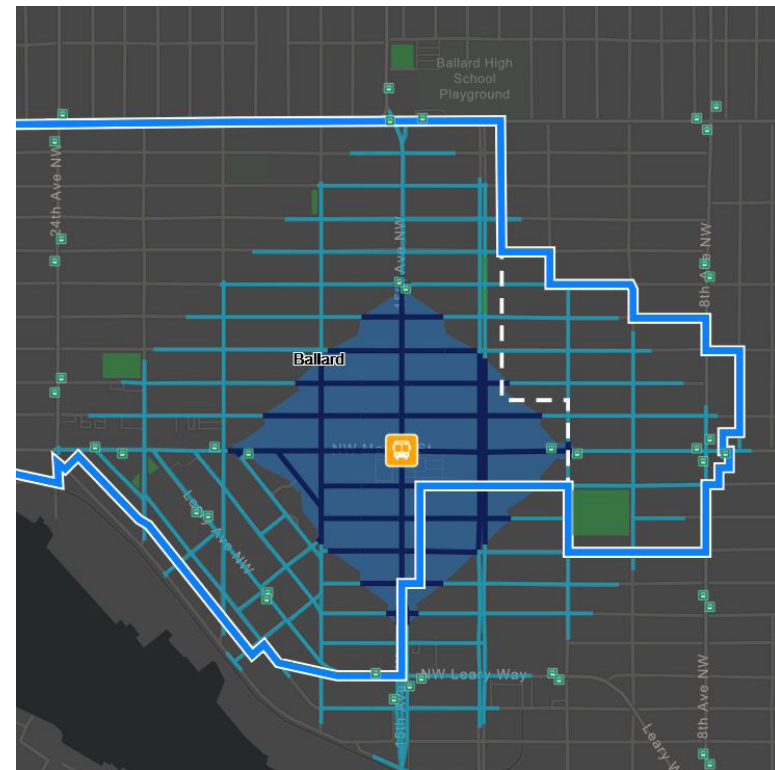


Fig. 6 - Ballard Light Rail Station & Walkshed, City of Seattle

13 Sound Transit, "Ballard to Downtown Seattle Transit Expansion Study Final Report," June 9, 2014.

Car to Pedestrian

Ballard has always had a strong dependence on the automobile. Lanes are wide, parking is abundant, and current service and infrastructural amenities support the continued use of cars. There are several “stroad” type streets, 15th and Market, that present a challenge for pedestrians to cross. A stroad is defined as the combination of a street (a place where people interact with businesses and residences) and a road (a high speed route between productive places).¹⁴

The question is, how does Ballard begin to transition from a neighborhood built for automobile use, to a community focused on pedestrian walkability? The answer is complex and composed of several factors. Mass transit plays an important role. To activate sidewalks, there needs to be a consistent user-base. A link light-rail station means that there will be more people walking to and from that station using sidewalks. But it is more than just sheer amount of pedestrians. Those pedestrians have to feel safe. They also have to feel a sense of ownership over the public domain. There are easy fixes to this: more crosswalks, slower speed limits, added landscape and street trees. But the more complicated and arguably more important factor is built form.

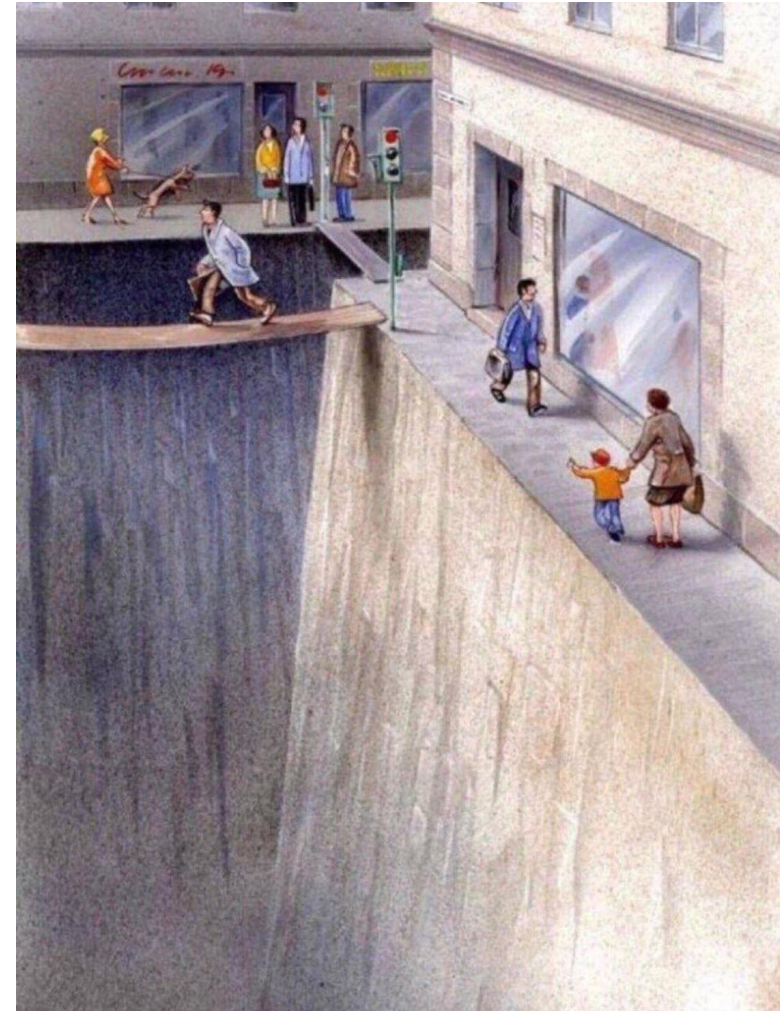


Fig. 7 - Karl Jilg, Swedish Road Administration

The Missing Middle

“Missing Middle” refers to the housing types that range in scale between high density 5-over-2 construction and single family homes. Specific building types include: mid-rise, townhouse, and row-house.¹⁵ Zoning that accommodates these building types is LR1, LR2, and LR3. Detail regarding these zoning types can be found in the appendix on page 87.

The importance of the missing middle cannot be overstated. Single family homes are too expensive for young families to afford and high density 5-over-2’s can be too small to support a family. As of 2017, 40% of Seattle homes are listed at or above 1 million dollars (overwhelmingly based on land value).¹⁶ According to a report last year by Zillow, the difference in average annual housing cost to live in the city is \$9,000 higher than to live in the suburbs.¹⁷ In order to retain young families in Ballard, development of the missing middle is critical. The missing middle provides density and affordability.

Diversity in housing-stock is also important. Building diversity generates a more unique urban character. It could also be said that a diverse range in housing-stock helps contribute to growth by providing prospective renters and buyers with a range of options. Unit diversity is also important. Figure 8 shows the disproportionate amount of units built for singles and couples, with significantly fewer options for families.

Multifamily construction in Seattle by neighborhood

Submarket Cluster	Studios	One-bedroom	Two-bedroom	Three-bedroom
Ballard (2012-2017)	24%	60%	15%	0%
Ballard (Before 2012)	14%	55%	29%	2%

Fig. 8 - Ballard Unit Distribution, City of Seattle

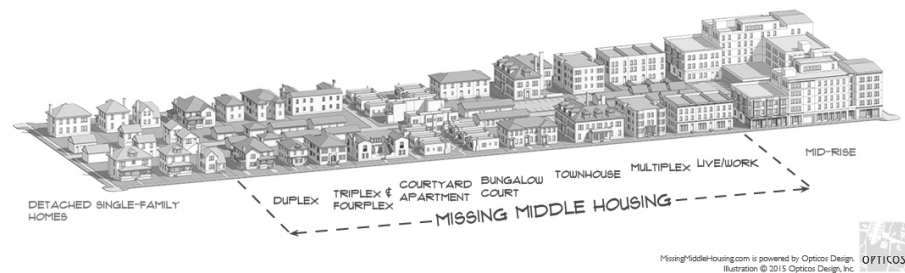


Fig. 9 - Missing Middle Diagram, Opticos

- 15 Opticos Design. “Missing Middle: Responding to Demand for Walkable Urban Living,” Accessed March 8, 2018. <https://opticosdesign.com/missing-middle-housing/>.
- 16 Sarah Anne Lloyd, “Seattle Has a Family-Size Housing Problem,” Curbed Seattle, September 13, 2017. <https://seattle.curbed.com/2017/9/13/16303898/three-bedroom-apartments-family-size>.
- 17 “Press Releases: Families Spend \$9,000 More a Year to Live in City vs. Suburbs,” Zillow, March 6, 2017. <http://zillow.mediaroom.com/2017-03-06-Families-Spend-9-000-More-a-Year-to-Live-in-City-vs-Suburbs>

Community

Community is often a loosely defined term, misconstrued and used in varying contexts. In the context of this thesis it is used in a more empirical way.

Community is the feeling and sense of ownership residents and neighbors collectively have over their surrounding environment.

It is easy to get caught up in the more statistical and mathematic variables of growth (ie: total density, owner returns, unit count, unit distribution, transit ridership, equity, economic gains/losses). However, all of those variables should be secondary to or simply supportive of community. Above all else, how Ballard grows should enhance, support and inspire a sense of community.

There is an energy residents have in Ballard. It is a passion to make their community stronger. It can be seen in the numerous organizations, turnouts for neighborhood development meetings, and local events that occur regularly. Ballard is growing, and ready for more growth. However that growth must be done in a way that does not detract from or dilute Ballards unique character and community roots.

Planners, designers and architects must understand that community is not built from scratch and neighborhoods are never a blank canvas. Community is fostered overtime. It is imperative that community is seen not as a product of what is built rather, what is built influences and hopefully supports, a surrounding community.

Response

02

Managing growth and density in Seattle, especially in East Ballard, in a healthy, affordable and sustainable way is a difficult task. This is an issue that is relevant to Ballard's immediate needs and not so distant future. There are many variables that need to be addressed within the scope of urban growth and change. The following is a series of factors that cannot be overlooked as we begin to navigate the path to sustainable growth in Ballard. These factors demand thoughtful consideration and artful response. Analysis of these factors as they apply to the East Ballard context will be used to develop strategies and design.

Place Making

Perhaps the most effective way to support community is through place-making. Place making enhances a neighborhood's identity and unique character. It is the well thought out placement of form and program.

Place making shapes and establishes destination. A place must not be disorienting. Rather cues must be given to the user for them to identify place and orientation within the urban context. Furthermore place making should be a layered responsive approach, done in a way that gives ownership of the urban realm to the people within it rather than the cars within it.

How is this done? One answer might be hierarchy and diversity. Strict uniformity can be disorienting. Hierarchy and diversity can be best understood when applied to buildings and streets. Building stock should be diverse in age, type, scale, material, texture and definition.¹ Likewise, streets should be understood within a hierarchy. A main street should be distinguishable from a side street, a side street from a residential street. Program and destination must give priority to the pedestrian.

In Ballard today, good place making is occurring along west Market Street. Several pedestrian oriented bars, restaurants and shops reinforce place. The area also boasts the Ballard farmers market every Sunday, as well as an array of seasonal festivals, making it a pedestrian destination. Conversely, there is a lack of place making in East Ballard. Destinations are accessible primarily by car. Buildings are oriented not towards the sidewalk but rather a parking lot or driveway. Some specific types of program further reinforce this orientation, they include gas stations, fast food, and auto-body shops. Even program that need not be oriented towards prioritized car access chooses to be, such as the Safeway grocery and Ballard Market grocery.

1 Jeff Speck, *Walkable City: How Downtown Can Save America* (New York: Farrar, Straus and Giroux, 2012), 237-251.

Connectivity

Place is navigated through the intricate grid of streets and paths that serve to connect one thing to another. As we grow, it is important to build connections in a way that all basic needs are accessible by foot from where one lives, and if not by foot, than by mass transit. Compact walkable urban neighborhoods allow for stronger communities

There are four categories that make up basic needs and services accessible by foot or transit. They are education, health, food, and culture. Education includes access to preschools, public schools, private schools, colleges and universities. Health includes access to medical institutions such as clinics, pharmacies, and hospitals, as well as access to services related to exercise and a mental health. Food is access to a diverse range of grocery, market, conveniences stores and food banks. Culture is access to things such as civic space, community centers, cultural centers, and libraries.

In addition to being able to connect to all types of basic services, connectivity also means overall accessibility to places outside of ones community, such as access to downtown or other urban centers around a metropolitan area. Currently Ballard is well connected to immediate basic services within the neighborhood itself. However it is less connected by means of mass transit to other Seattle Urban Villages. As previously mentioned this will be addressed by a new light rail station in 2035.² Until then, Rapid Ride and regular bus service aims to better connect Ballard.

2 City of Seattle Department of Planning and Development. "City of Seattle Comprehensive Plan."

Street Character

“Almost nobody travels willingly from sameness to sameness and repetition to repetition even if the physical effort required is trivial.”³

As an interpretation of Jane Jacobs statement above, uniformity is not as interesting as variety. Variety along a streetscape encourages movement and spurs interest. Moments are found along walks that give pause and create curiosity. To have these moments there must be breaks, depth and definition in streets. Architect and urban designer Jan Gehl observed that facades with a vertical orientation make a walk seem shorter as compared to facades with a horizontal orientation.⁴ This is insightful into thinking about a building as it relates to more than just itself. There is an importance it has as a piece within a collection of facades that span the length of a street. In the consideration of context a facade should not reflect its neighbors, rather it can encourage continuity through its own uniqueness.

A street’s character is not only defined by its facades. A street should be instantly understood and identifiable by its relationship to other streets across a culmination of variables. Some variables are more easily identifiable at first glance: sidewalk width, lane width, lane types, trees, landscaping, medians, signage. Other factors are more sensed rather than seen: activity, energy, safety, comfort. All contribute to the character of a street.

3 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Vintage, December 1992), 129.

4 Jan Gehl, *Cities for People* (Washington, D.C.: Island Press, 2010), 77.

5 Jeff Speck, *Walkable City: How Downtown Can Save America* (New York: Farrar, Straus and Giroux, 2012), 11.

Density

Current East Ballard single family neighborhoods are primarily at or below 10 units per acre. A study on travel habitats by John Holtzclaw provides an interesting look at the effects of density distribution on car use. Holtzclaw studied 28 cities and found that an increase in density from 2 units per acre, to 20 units per acre resulted in the same efficiency savings (or reduction of cars from the street) as an increase from 20 units per acre to 200 units per acre. 10-20 units per acre is the density at which neighborhoods become walkable. What this shows is that the most gains to be had are before the 20 unit per acre mark.⁶ This is in contrast to the current Seattle urban village plan that protects single family neighborhoods and opts to increase density where it is already most dense.

In fact, Seattle's own comprehensive plan has conflicting goals. The comprehensive plan outlines several specific reasons for the urban village strategy. Three of those goals are:

- Preserve the character of Seattle's predominantly single family neighborhoods
- Reduce dependence on private motor vehicles
- Improve public health by promoting walking and biking⁷

6 John Holtzclaw, "Using Residential Patterns and Transit to Decrease Auto Dependence and Costs," Natural Resources Defense Council, June, 1994.

7 City of Seattle Department of Planning and Development. "City of Seattle Comprehensive Plan."

As seen by Holtzclaw's density analysis, protecting single family homes actually promotes dependence on private motor vehicles. Furthermore, due to its low density, single family home zoning impedes the amount of walking and biking in the city. To further emphasize the conflicting principle of protecting single family homes, under land use policy, the comprehensive plan goes on to list:

- Seek opportunity in rezones or changes in development regulations to incorporate incentive programs for development of housing that is affordable in the longest term practical.⁸

Due to the lack of affordability of single family homes, the allowance of multifamily residential land use and low rise zoning would make housing much more affordable over the long term. Fortunately, MHA's preferred alternative will force up-zoning of single family as part of the Ballard expansion, as well as in many other areas across the city of Seattle.⁹ However up-zoning may not be the only viable solution to manage density. Space is a resource that must be used more efficiently. Strategies on how to realize the full potential of space will be explored throughout this thesis.

8 Ibid.

9 Seattle Housing and Affordability Living Agenda, "Mandatory Housing Affordability (MHA)."

Walkability

In his “General Theory of Walkability” Jeff Speck states as follows:

*“... a walk has to satisfy four main conditions: it must be **useful, safe, comfortable and interesting**. Each of these qualities is essential and none alone is sufficient. Useful means that most aspects of daily life are located close at hand and organized in a way that walking serves them well. Safe means that the street has been designed to give pedestrians a fighting chance against being hit by automobiles; they must not only be safe but feel safe, which is even tougher to satisfy. Comfortable means that buildings and landscape shape urban streets into outdoor living rooms, in contrast to wide-open spaces, which usually fail to attract pedestrians. Interesting means that sidewalks are lined by unique buildings with friendly faces and that (there are) signs of humanity abound.”¹⁰*

In breaking down these four main conditions, it can be assessed as to how they apply to East Ballard. The first condition, “useful,” is partially satisfied today. Indeed many current residents boast the best part of Ballard is that everything you could need exists within. There is no need to travel far to get to basic necessities. Useful as a condition has a strong correlation to factors of connectivity and place-making. The less addressed part of useful is “organized in a way that walking serves them well.”

The second condition, “safe,” could use some work. Especially so along 15th and imperatively at the intersection of 15th and Market. Figure 83 on Appendix page 86 illustrates a heat map indicating the amount of

pedestrian collisions in East Ballard. 15th Avenue was built in a way as to not cause car congestion. Instead, it was built to stimulate the continued flow of traffic, causing cars to move at a more rapid pace. 15th may never be a street *for* pedestrians, but it does not have to be a street that endangers them, actively working against their existence. Side streets apart from 15th and Market are generally safe.

The third condition is “comfortable.” This can be viewed as a sense of ownership. Does the pedestrian feel ownership over the space around them and do they feel like they belong in that space. It could be argued that this condition is sorely lacking in East Ballard. 14th Avenue is a good example of a street that is safe, but not necessarily comfortable. Traffic is slow and there are few accidents, however the pedestrian does not feel ownership over the street as four separate parking lanes exist across it.

The fourth condition is “interesting.” East Ballard has the potential to be interesting. Where East Ballard excels are its old industrial buildings and its single family homes. Unfortunately, both actively work against the building of density in and around the urban village. Generating and preserving diverse streets and building stock will help to aide this condition.

10 Jeff Speck, *Walkable City: How Downtown Can Save America* (New York: Farrar, Straus and Giroux, 2012), 7-11.

Strategies

03

How can these response factors be holistically addressed? Through study of various thought and opinions from architects, residents, planners, engineers, data bodies, city officials, and mentors, several strategies have been outlined in the following section with intentions they be implemented together. These strategies are not revolutionary. Neither are they a means to an end. They are lessons learned from past success and past failure. These strategies are simply to be used or regarded as a way forward; a way to reinforce community and the users place within that community as growth and change occur over time.

Building Incrementally

To discuss building incrementally it must be first defined. Incremental development, as planner and former civil engineer Charles Marohn defines it, is building to the next level of intensity; building to the next level of intensity as opposed to building what is possible in that moment.¹ There are a number of reasons mega-projects get built; politics, marketing, capital, public pressure, investment to name a few. But the end products are often too grand, with an almost certainty to go over budget. This is particularly in reference to major public infrastructure projects, of which include roads, intersections, street-car, light-rail, high-speed rail, parks and plazas. All of these are of course necessary things in a major city urban context, and the argument is not directly against them. Instead, the argument is against the way in which they are currently constructed, which is, quickly and when funds are available. The same can be said for many private projects, commercial and residential. The intent is to address the immediate concern. The alternative is to build incrementally. If a developer can only ever build to the next level of intensity, the risk becomes very minimal. A city then treads lighter and anticipates the next step in a more gradual way. This is not a new concept. This is in fact a very old concept that has worked for hundreds if not thousands of years.

The second interpretation or evolution of developing incrementally is that in which buildings are not demolished to start again new, but instead adapt and physically change over time, or in other words, “how buildings learn” as coined by Stewart Brand.²

1 Charles Marone, “Thoughts on Incremental Development” Strong Towns, August 24, 2017, Podcast.

2 Stewart Brand, *How Buildings Learn: What Happens After They’re Built* (New York: Penguin Books, 1995).

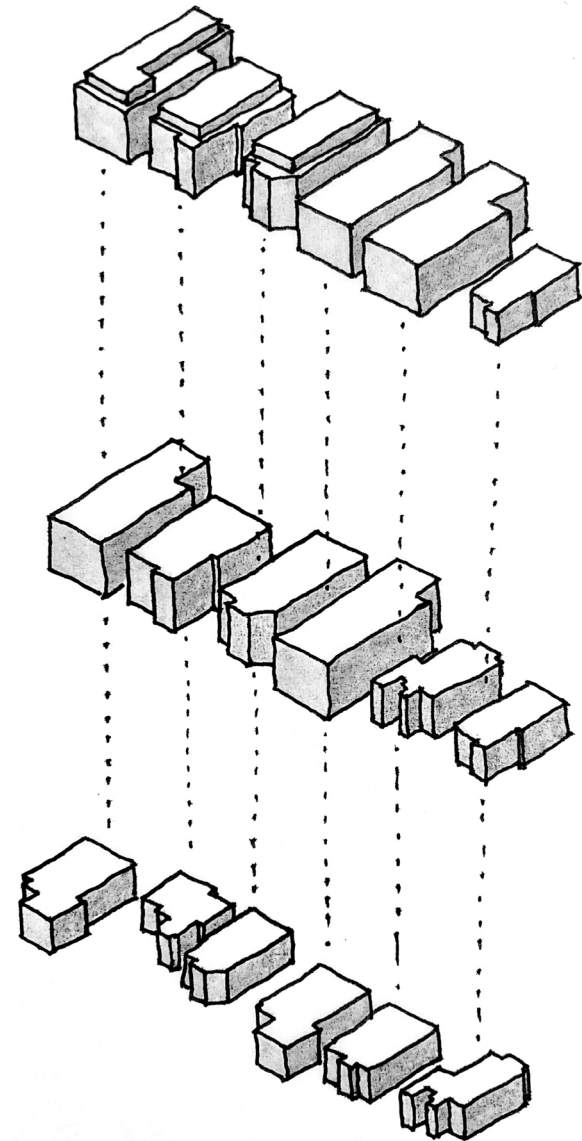


Fig. 10 - Incremental Diagram

Building Incrementally

“The conversation will be difficult because it is fundamental. The transition from image architecture to process architecture is a leap from the centuries of controllable things in space to the self-organizing complexities of an endlessly unraveling and unraveling skein of relationships over time. Buildings have lives of their own”²

What can be drawn from this quote is the criticism that architecture is too often built to serve one moment. There is a lack of attention, or total disregard to the process and the life-cycle of buildings. When changes are made to a unit or a home they are improvements to increase that home’s real-estate value rather than the current resident’s use value. However, if the resident is allowed or encouraged to age-in-place, improvements are then specifically made to serve that individuals needs. This of course is not forced encouragement, but rather a community driven sense of belonging. In order to preserve an apartment building itself as zoning and land use change around it, a more radical solution is needed. If it is assumed that buildings will only ever be built to the next level of intensity as Marohn suggests, it can than be assumed and planned for the physical adaption of the next level. In doing so a building can begin to serve multiple life-cycles. It has become customary to tear one thing down in order to build another. Why is this? The answer is that it is usually cheaper, easier, and what is existing has little value compared to a newer alternative. To this it could be argued that buildings should be built in a way that retains value and increases resiliency. Kevin Lynch expresses a similar sentiment:

“We prefer a world that can be modified progressively, against a background of valued remains, a world in which one can leave a personal mark alongside the marks of history”⁴

3 *Ibid.*, 71.

4 Kevin Lynch, *What Time is this Place?* (Cambridge: The Massachusetts Institute of Technology, 1972), 39.

Constructing a Polyvalent Architecture

Polyvalence is a type of flexibility, however it is flexible in the sense that use changes while form stays the same. Herman Hertzberger pioneered the idea of polyvalent architecture. Hertzberger argues that complete flexibility in form and use denies a standpoint, seeking to achieve all solutions while never being the best solution. Whereas polyvalent architecture makes a fixed and definitive stance that can accommodate several “perfect” solutions for different people and different uses over time.⁵

There is a stale monotony to much of what is built in Seattle today. This can be seen in the current 5-over-2 model. Though the 5-over-2 has its place, there are simply too many of them. How can spaces be created that are both tools for density and are also unique and interesting places to live; places that encourage and adapt to human interaction rather than defaulting to human indifference? This can be achieved through thoughtful polyvalent architecture. As Hertzberger states “...we have come to a point where uniform dwellings are assembled in monotonous, uniform building blocks.”⁶ Though he is referring to building in the 1990’s, it could be argued that the same holds true today. To simply accommodate growth is not enough. It is imperative that architecture adapt. Not through an ever-changing flexible form, but rather an ever-adaptive use of form. There is an inherent relationship between form and use that must be acknowledged.

Polyvalence is not simply form, rather it is also the spatial response within and around form. A space can cause many various human responses and emotions. Space can feel safe, or inversely unsafe. Space can cause one to retreat, or inversely invites one in. There is seemingly no limit to the range of possible responses stimulated by spatial interaction. It is naive to see every space as isolated and absolute. The world is made up of a series of spaces, but those spaces do not have to have hard edges between them. Spaces can layer and overlap. Those overlaps need not be fixed, rather they can fluctuate.

An example might be a street. A street is a complex layering of spaces with several types of users or groups of users. The car, the bicycle, the pedestrian, the dog, the child, the mailman, the garbage truck, the delivery truck, the school bus, the city bus, the motorcyclist, the school group, the skateboarder, the list goes on. Quite certainly different streets have a different collection of users. And quite certainly different locations have different streets: downtown, suburban, rural. But a commonality is that the ownership over a space within a street fluctuates based on the current user and that users needs. At 9 a.m.

5 Herman Hertzberger, *Lessons for Students in Architecture* (Rotterdam: Uitgeverij 010 Publishers. 1991), 146-151.

6 *Ibid.*, 147.

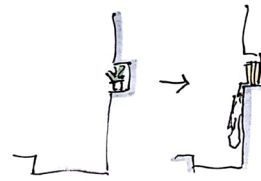
7 *Ibid.*, 150-151.

Constructing a Polyvalent Architecture

on a Wednesday, the garbage truck might indeed have the majority spatial ownership, whereas at 3:30 p.m. on a Friday, the group of school children fresh out of class exhibit a majority share on the same street location. Patterns of ownership are not always so predictable. In matters of emergency or fire, firetrucks and authorities command a larger share of street ownership. By actively designing spaces in a way that recognizes or even provides for the change of use and change of user, a deeper richness and a more adaptive response can occur.

“The uniform urban plan and the uniform floor-plan are based on the segregation of functions, and it is the blind obedience to the dictates of these functions that has resulted in taking distinctions between living and working, eating and sleeping etc. as the starting point for conceiving the spaces for different purposes in different ways, on the grounds that different activities make different specific demands on the spaces in which they are to take place... it is the people who make specific demands on the space in which they are to take place.”⁸

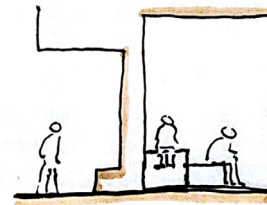
- Herman Hertzberger



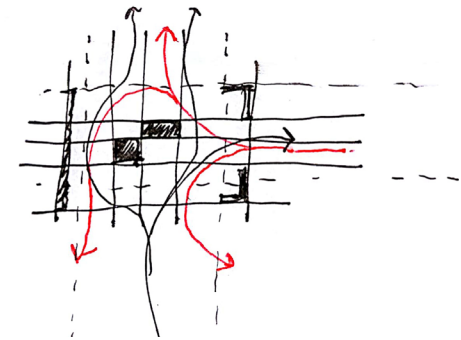
Repurpose



Age relation to Space + Form



Moments + Transitions



Form inspires Path + Congregation

Fig. 11 - Polyvalent Series

8 Ibid., 147.

Constructing a Polyvalent Architecture

Today form is constructed to fulfill specific individual purposes. There is however a greater efficiency in constructing forms that can take on multiple uses. Often form that is built for one specific use tends to take on multiple uses regardless. Accommodated uses do not have to be prescribed or understood from the onset. Rather, limiting constraints on form can allow it to take on a range of initially undetermined uses. Form can give cues to how a space can or should be used but will only be activated in the way the user sees fit. This is to say, different users will use a form in different ways.⁹ What one person might use as a step, another might use as a bench. The importance of polyvalent form is its ability to interpret and adapt.

It is in a series or progression of component forms that then begin to shape a place. Two reciprocal relationships can be seen, that between form and use, and that between the whole and its component parts. The whole is a system, often a grid. Herman Hertzberger describes the relationship between parts and the whole as follows:

“And because the grid vests the individual components with the common inclination, not only will the parts determine the identity of the whole, but conversely the whole will contribute to the identity of the parts. The identity of the parts and of the whole will be reciprocally generative.”¹⁰

Here the importance of this relationship can be understood. One begins to define the other, but one is not the reason for the other. As it applies to current growth and development, this is paramount. A master plan exhibits a system. A building exhibits a component within that system. The most thorough, well thought-out, master plan is meaningless if it does not respond to how buildings can take form within it. A building can only have limited success if it does not contribute to the system as a whole. This is to say, comprehensive top down planning is necessary to define loose constraints. This is also to say, architecture in both the private and public realm must not be indifferent to its context.

Polyvalence can be designed and discovered in the integration of space, form and structure. Structure refers in this context to the system such as a grid, spline, or a combination thereof. Form refers to the component parts within the system. Space refers to the space between, shaped by form.¹¹

9 Ibid., 150-151.

10 Ibid., 119.

11 Ibid.

Designing for Live / Work

The two places people spend the most time at are home and work. While a person is at one, they are not at the other. This is a mis-use of space as a resource. Live/work encourages an investment in place. Time spent not commuting is time then devoted to productivity or enjoyment. Today our ever evolving society continues to make the live/work typology more appealing. Live/work is not just for artist lofts anymore. Currently, over 50% of the US workforce holds a job that is compatible with telework, and 20-25% of US employees already telework at a regular frequency.¹² Telework allows for a means of low intensity live/work housing.

Live/work types include, live-with, live-near, and live-nearby. The live-with type has no separation between home and office. Both exist within the same open atmosphere. This type is ideal for telecommute, artist lofts, retail, or online business. The live-near type includes both home and office within the same shell or building, however separation exists between the two. This type is ideal for those who need a separate devoted space for customer interaction. Live-nearby refers to home and office separated into two different buildings, a short walk from one another. This type might be ideal for co-working, telecommute, and startup functions.¹³

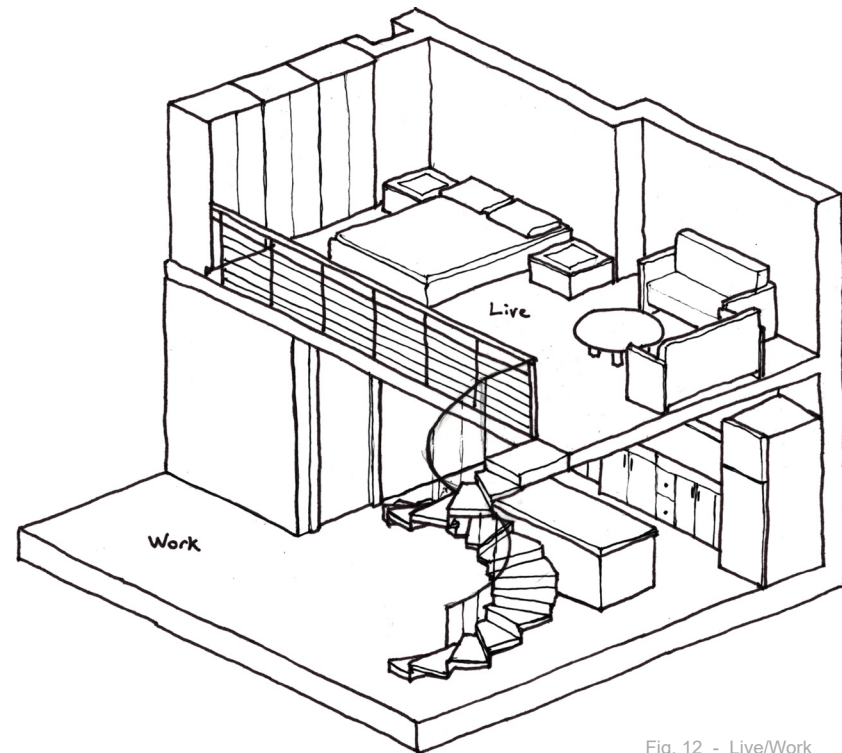


Fig. 12 - Live/Work

- 12 "Latest Telecommuting Statistics," GlobalWorkplaceAnalytics.com, June, 2017. <http://globalworkplaceanalytics.com/telecommuting-statistics>.
- 13 Thomas Dolan, *Live-Work: Planning and Design* (Hoboken: John Wiley & Sons, Inc., 2012), 16-18.

Designing for Live / Work

The challenge with live/work is isolation.¹⁴ In order to avoid isolation live/work must be situated in a location where all basic services are in close, walkable proximity. Places that have good walkability cause more pedestrian interaction. To further inspire interaction, architect Thomas Dolan argues the importance of the live/work courtyard. Here he discusses lessons learned in regards to a live/work courtyard project, South Prescott Village:

“Perhaps the most important, an understanding of the unique nature of live-work and its potential for isolation gave rise to the courtyards and gardens placed purposely along the entry path, such that as one steps out of one’s unit, the opportunity is there to cross paths with another resident who is taking a break from work to catch a breath of fresh air and, yes, encounter someone else in the same situation.”¹⁵

In Ballard there is currently a movement to construct live/work housing. However the live/work that is being constructed is simply being fit to the 5-over-2 model. There is a greater potential to implement live/work within form that encourages interaction rather than promoting isolation. In doing so, there could be a greater and more efficient integration of form and use.

By living and working within the same immediate context, one begins to invest themselves more into a specific location.¹⁶ This investment creates a stronger bond and a greater sense of ownership over one’s environment. In doing so this begins to strengthen community and engagement.

14 Ibid., 32.

15 Ibid., 62.

16 Ibid., 97.

Design

04

To begin to conceptualize the previous strategies as they apply to the East Ballard site and analysis, three scales will be studied, the transect, the block, and the building with accompanied courtyard. The courtyard itself as tool will be seen across each of these scales. Through these studies, it can be understood how growth and density can be better implemented and managed in East Ballard.

Site

Within Ballard, the eastern edge of the urban village boundary will be studied. Figure 14 outlines the specific six block study area in red. Outlined in black is the extents of the Ballard Urban Village. The blue line indicates the urban village expansion due to occur under HALA's proposed MHA zoning guidelines. Figure 13 and Figure 15 represent the scales to be studied. Red represents the transect, green represents the block, and the yellow represents the courtyard with accompanied building.

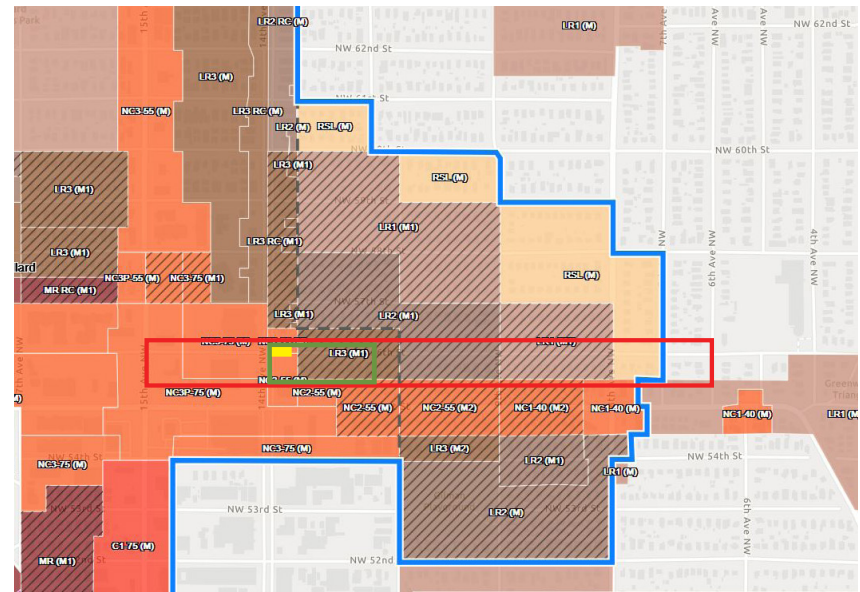


Fig. 13 - Study Area / Zoning

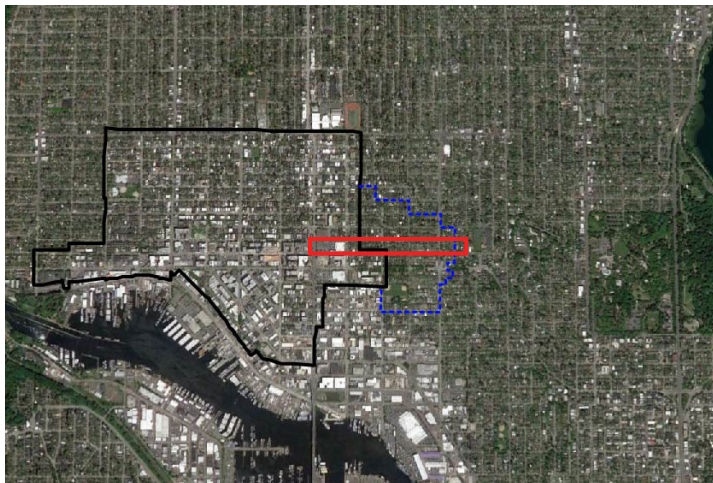


Fig. 14 - Ballard Satellite, Google Maps

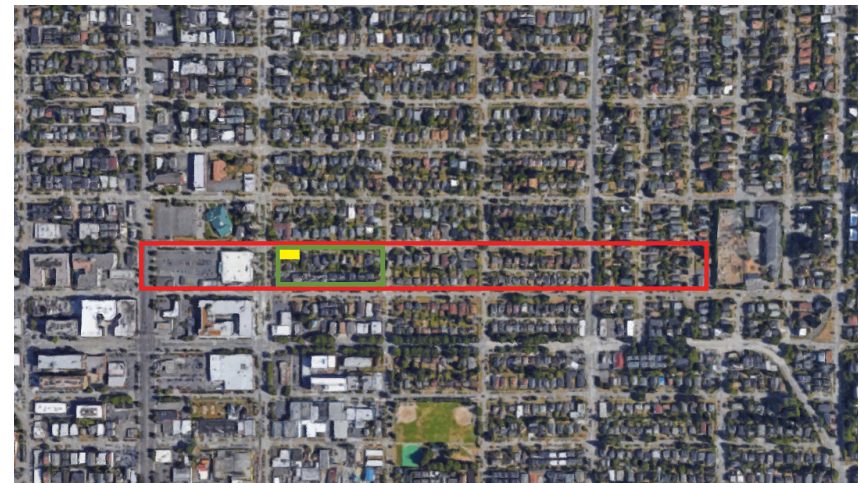


Fig. 15 - Study Area / Satellite

The Neighborhood Transect

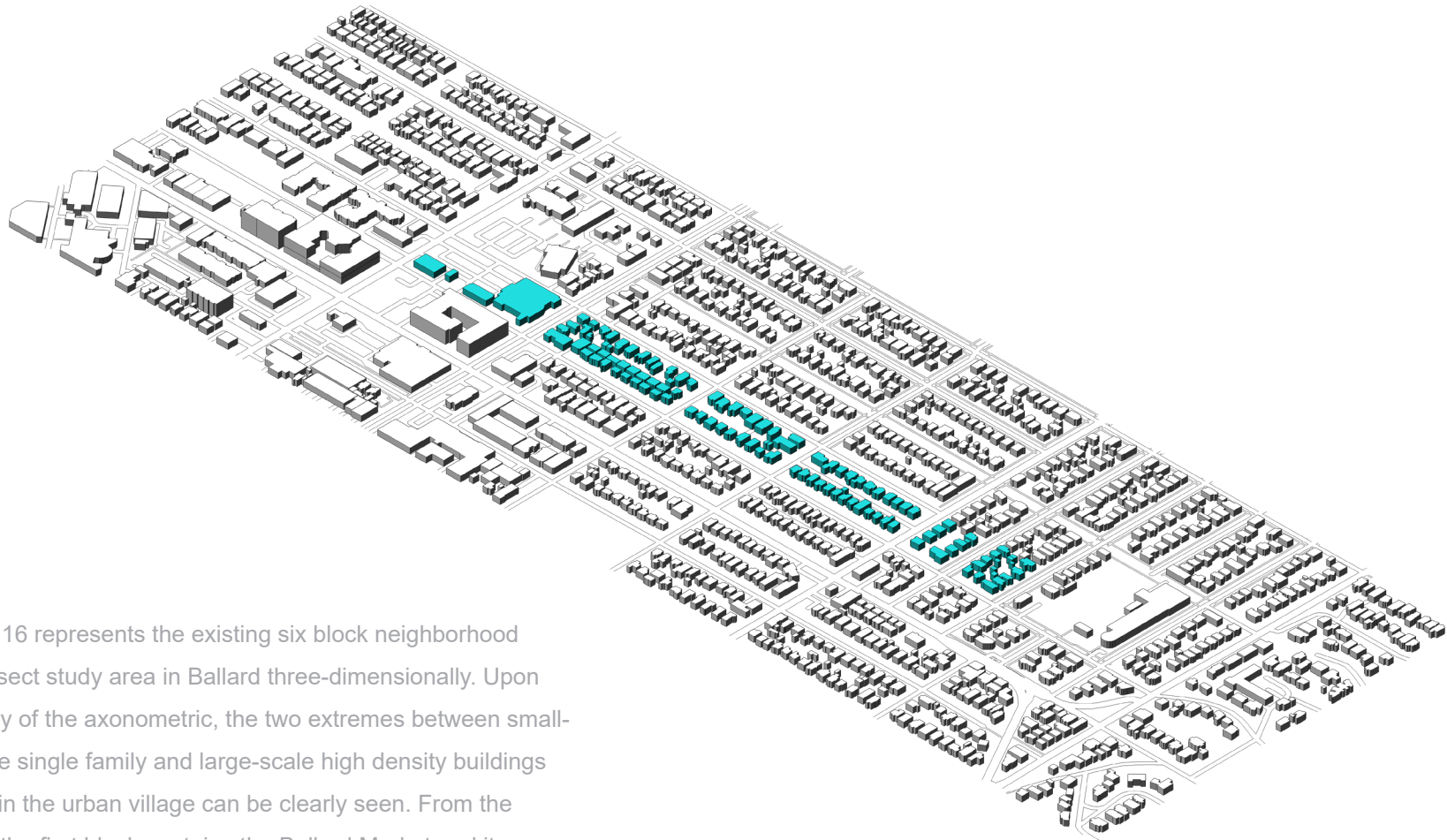


Fig. 16 represents the existing six block neighborhood transect study area in Ballard three-dimensionally. Upon study of the axonometric, the two extremes between small-scale single family and large-scale high density buildings within the urban village can be clearly seen. From the left, the first block contains the Ballard Market and its adjoining parking lot. Though design will not focus on the Ballard Market itself, it should be understood that across the transect this block plays a key roll as it may well be the location of the future Ballard Link light rail station.

Fig. 16 - Study Area / Axonometric

The Neighborhood Transect

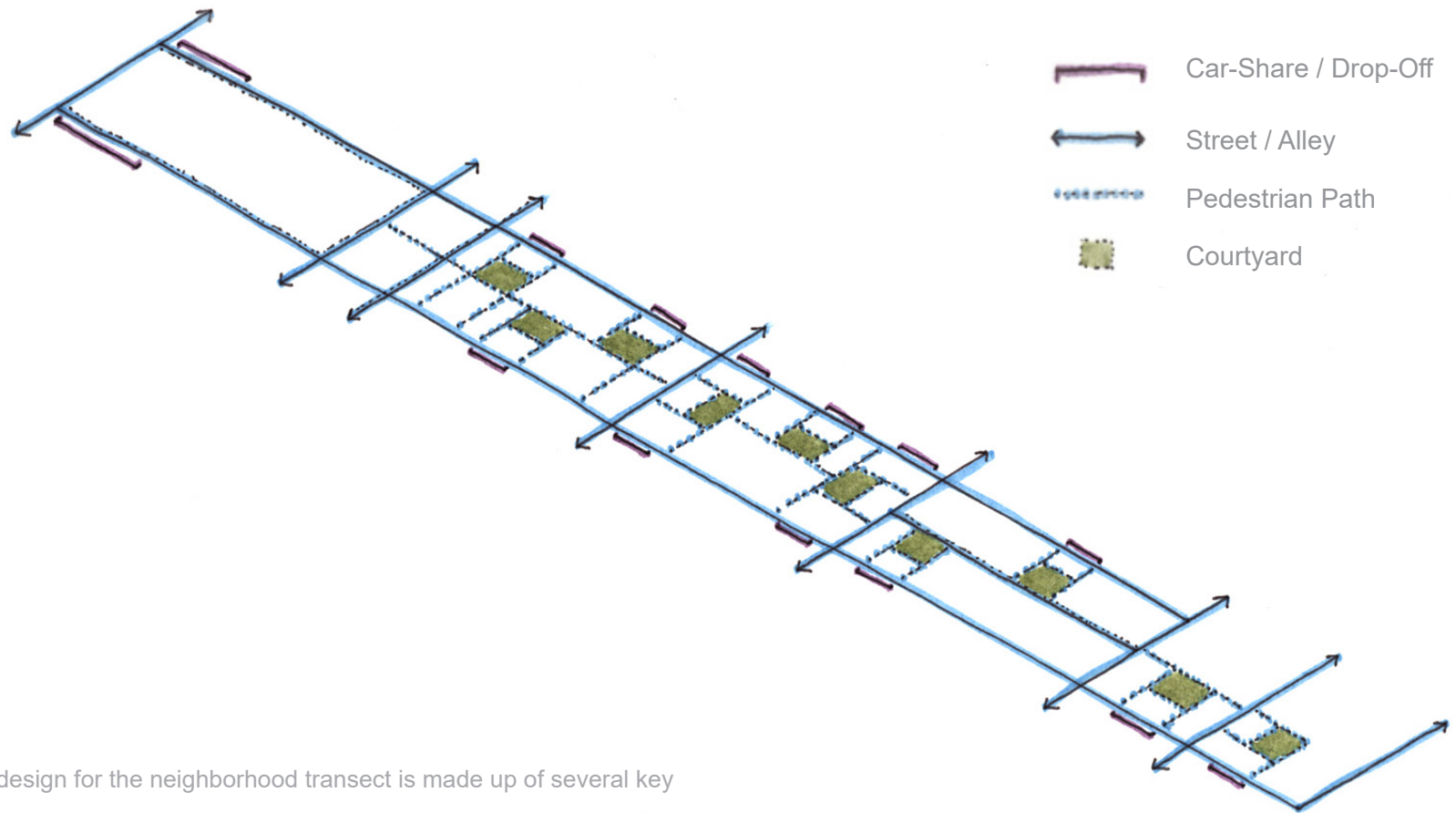


Fig. 17 - Neighborhood Transect Diagram

The design for the neighborhood transect is made up of several key component parts. Courtyard, pedestrian path, and car-share/drop-off, are integrated into the existing network of streets and alleys. Figure 17 diagrams the relationship of these component parts to each other and to the whole, across the six block neighborhood transect.

The Neighborhood Transect

The neighborhood transect begins to take shape over a period of time. Previous development patterns have not planned for or even allowed for incremental growth. For nearly 25 years the neighborhood transect study area has been stagnant and frozen, largely made up of single family zoning as shown in Figure 3 on page 6. Figure 18 illustrates the incremental transition from single family homes to a missing middle combination of low-rise and courtyard developments. Each above diagram relates to the corresponding massing diagram below, stacked to conceptually show how the neighborhood transect might incrementally change over time.

This is not a definitive assertion of where pedestrian path, courtyard, and car-share should go, but rather a study of how the neighborhood transect might begin to compose itself over time. Specific design decisions within this series begin to relate to existing infrastructure. For instance, two existing alleys are converted into the network of pedestrian paths. Furthermore, orientation and spacing of courtyards relate to the previous orientation and spacing of the courtyards that came before. Though the courtyard and pedestrian path connections are relatively isolated initially, further additions begin to build a resilient system. The key benefit is that, as applied to the neighborhood transect, incremental development with use of component parts allows this to be a spatially integrated system that builds upon itself (Figure 18 is broken apart to show a larger depiction of each incremental piece on appendix pages 72-77).

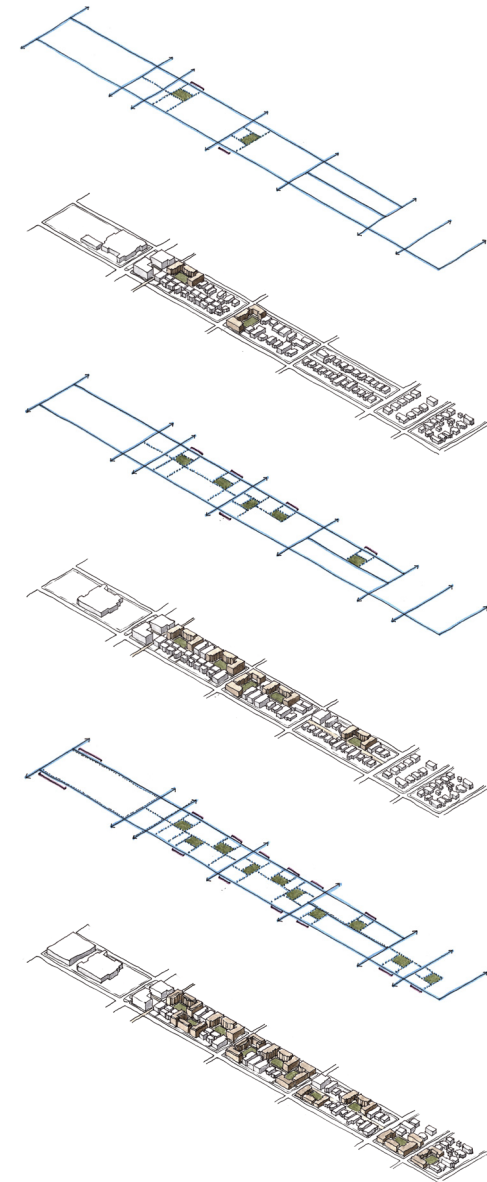


Fig. 18 - Neighborhood Transect Series

The Neighborhood Transect

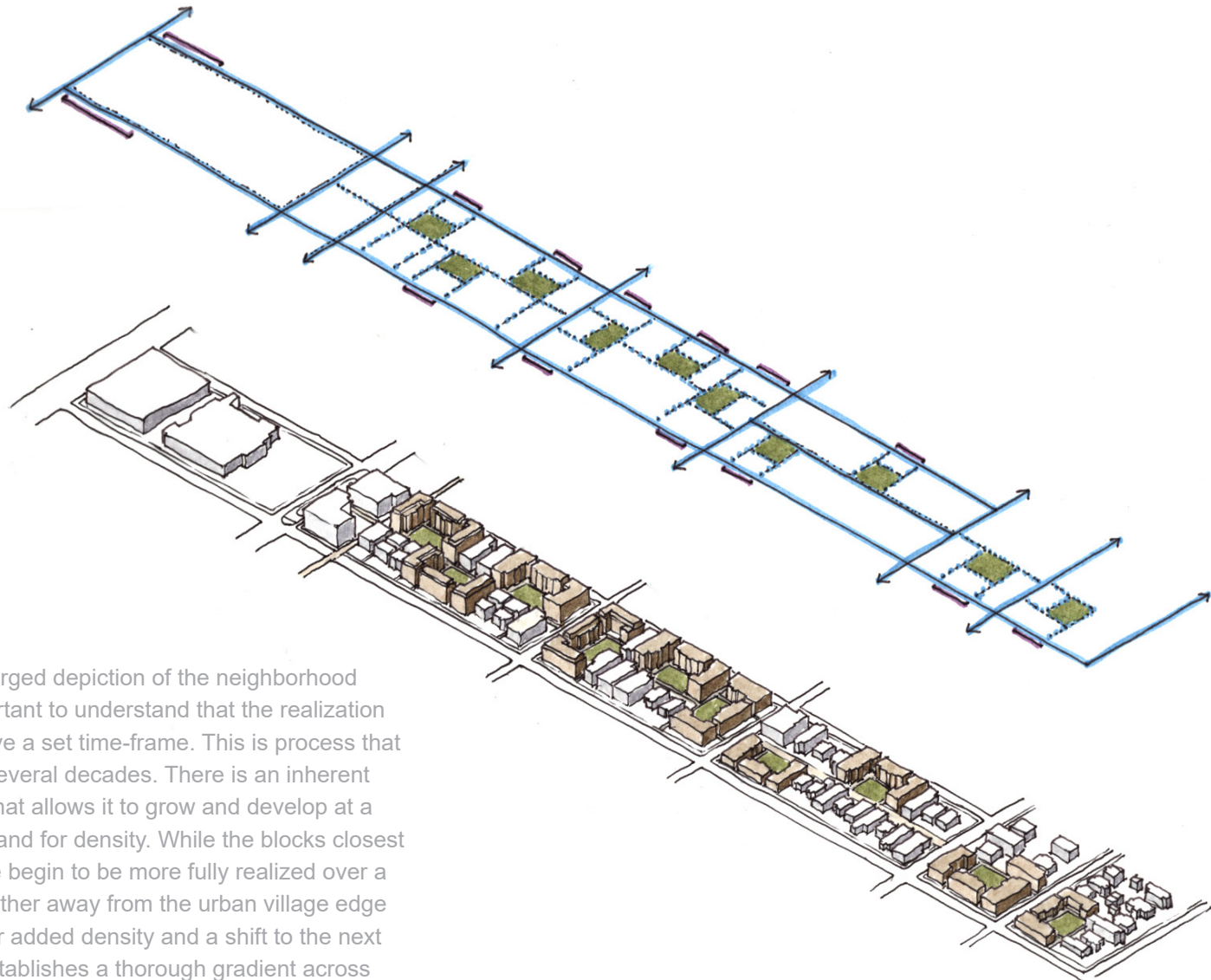


Figure 19 shows an enlarged depiction of the neighborhood transect study. It is important to understand that the realization of figure 19 does not have a set time-frame. This is process that may take a decade, or several decades. There is an inherent flexibility to the system that allows it to grow and develop at a pace relative to the demand for density. While the blocks closest to the urban village edge begin to be more fully realized over a period of time, blocks further away from the urban village edge incrementally prepare for added density and a shift to the next level of intensity. This establishes a thorough gradient across the neighborhood transect and allows for future growth.

Fig. 19 - Neighborhood Transect / Axon & Diagram

The Block

To better understand the system, the neighborhood transect is broken down and analyzed at the block scale. Though not all blocks are the same across the study area, they are composed of similarly sized parcels, 50'-0" wide by 100'-0" deep. This essentially defines a consistent modular grid over each block. Courtyard models adjust to the grid, spanning across four standard parcels each. The existing grid allows the courtyard models to be applied in a range of ways across the block. Orientation of each courtyard model may be adjusted and spacing between courtyard models may be shifted as long as it falls within the standard parcel grid.

Blocks can be composed in a variety of ways, and ideally in relation to the existing infrastructure and immediate surrounding component parts and neighboring buildings. Several examples of block composition can be seen on Appendix page 71. Each block has an individual maximum capacity for courtyard models, able to cover a little over half the total block area. Figure 21 represents a block at its maximum capacity. Interspersed between courtyard models are a variety of other missing middle housing types. Within the block, height of courtyard models and types of adjacent missing middle housing fall along the intensity gradient of the transect, directly in relation to neighboring blocks.

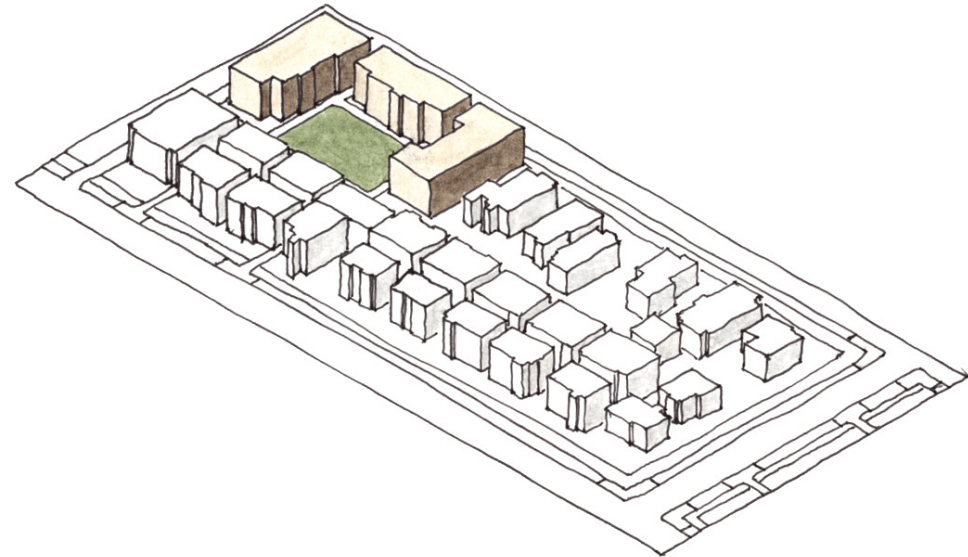


Fig. 20 - Block 1

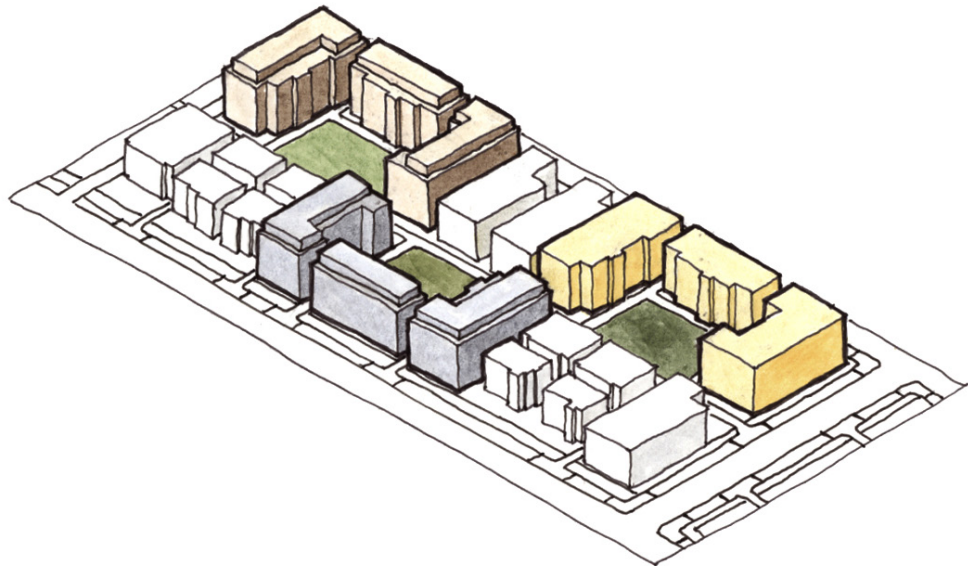


Fig. 21 - Block 2

The Block

A critical part of the block's composition is the pedestrian path. The path links courtyards together, creating a micro-community within the block itself. The edges of the courtyards begin to overlap the path, integrating into a system of public, semi-public, semi-private, and private spaces (street as public, path as semi-public, courtyard as semi-public, porch as semi-private, building as private). The system is layered in a way that allows for soft transitions across the public to private spectrum.

While one courtyard development may become more desirable to seniors, another may be more geared towards young families. Still another may be more desirable to students, craftsmen, co-housing, or any other group of like-minded interest. The idea is that people with shared interest can exist within several identifiable and linked scales of community; that of the courtyard, that of the block, and that of the greater neighborhood. Each courtyard development can take on its own individual character as collectively expressed by those who live there. These are then connected within the block by the pedestrian path.



Fig. 22 - Pedestrian Path

The Courtyard

The courtyard is a major piece and an integral part of the alternative growth model. Its design must allow for and even encourage a sense of ownership as a way to maintain activation of space. Contemporary American courtyards are too often highly manicured, pristine but desolate. Too nice and too clean to touch, demanding heavy private maintenance and upkeep. These courtyards may allow for access to light and air but lack a connection between use and user. The courtyard should essentially take on the character, quality, and functionality of a typical backyard.

As the courtyard model spans across four parcels, it essentially becomes a publicly accessible culmination of backyards. That is to say, if the usable open space of each (formerly single family) parcel were consolidated, they would make up the courtyard. To even further simplify, instead of four separate backyards, this model has one very big shared backyard.

In order to make the best use of this space, it must be broken down into human-scaled component parts. Through polyvalent design the exact function of these component parts may vary courtyard to courtyard, however the break-down of space allows for a range of hierarchy, intimacy, and activity across each courtyard's entirety.

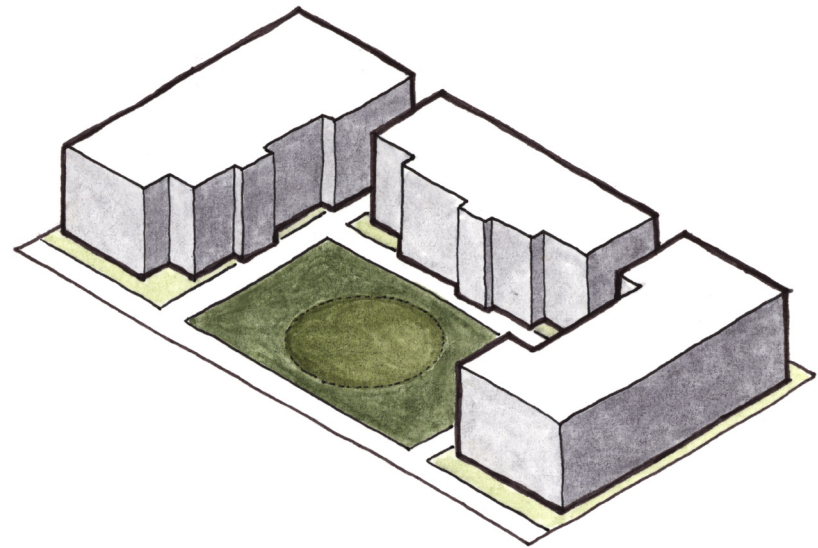


Fig. 23 - Courtyard Model

The Courtyard

One the courtyard's major component parts is *the garden*. The garden itself is a shared amenity among residents. It offers a space for people to meet and interact with neighbors in a relaxed setting.

The garden becomes a piece where change over time is experienced visually. This visualization of seasonal shifts can act as a tool for bonding. Neighbors can share joy in each others gardening masterpieces and misery in their vegetative defeats. Visibility from the porch allows residents to easily assess their plot, engaging with its progress or decline on a daily basis.

If allowed, this bonding can go beyond that of neighbors. Seen from the pedestrian path, the garden becomes of interest to those passing by on regular walks or routes. It becomes an object of interest to identify with for the casual onlooker. Indeed it may become a tool to spark casual conversation between those whom would never normally speak in a different context. This is not to say the garden will change social behavior, rather simply act as a tool or platform that allows for interaction and shared interest.

[The Garden]

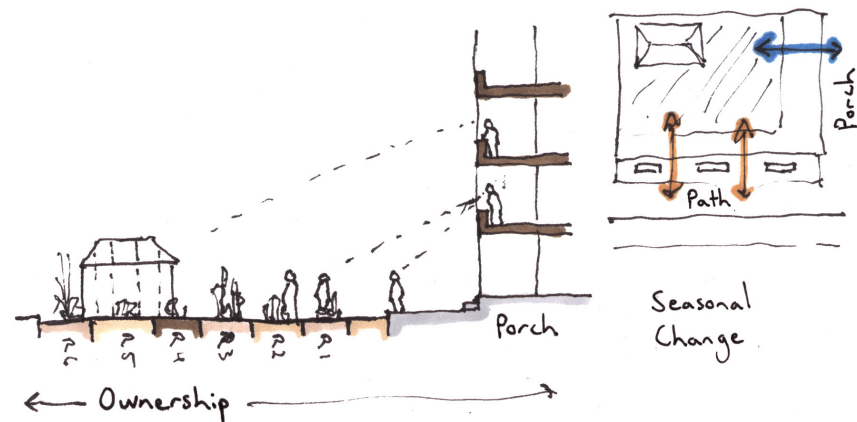


Fig. 24 - Garden

The Courtyard

Another major component of the courtyard is *the lawn*. The lawn fulfills all multipurpose functions as would be exercised across a typical backyard lawn. The lawn becomes the key space for recreational activities such as sports, games, play, lounging and gathering. These recreational activities may (and most likely would) vary per courtyard.

The lawn offers a space big enough for large group activity. Likewise, the space could be informally subdivided in a way that allows several small groups room for recreation. The lawn could also be used as a platform for neighborhood picnics or courtyard resident group gathering. Depending on the residents, the lawn could additionally be used as spill out space for live/work activities.

A diverse range of seating situated around the periphery of the lawn is important. Diverse seating allows people to rest and watch the activity taking place. A range of seating options also allows comfort to a variety of types of people young and old.

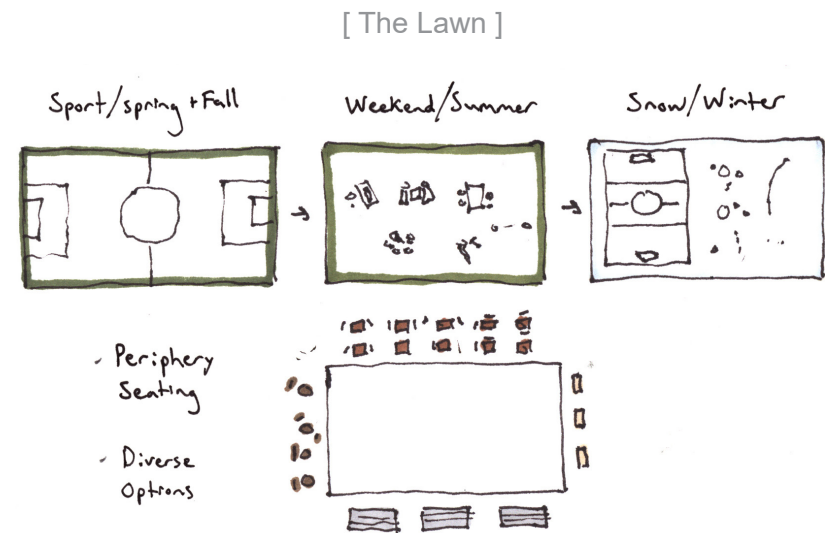


Fig. 25 - Lawn

The Courtyard

The next major courtyard space is *the hearth*. The hearth is foremost a central place of gathering. Who gathers, and for how long they gather is entirely relative. The hearth must accommodate a variety of gathering.

The hearth acts as a large back patio. A fire-pit acts as a center-piece, holding a group around its perimeter and allowing for discussion. A communal grill allows for cooking and sharing food among friends. A variety of flexible seating exists within the hearth, allowing it's users choice of how and where to rest and gather.

Whereas the hearth can be a place to invite friends from outside of those who live within the courtyard development, it can also provide a place of gathering for those who do live there. It also allows for smaller gatherings, among what might be just an intimate few.

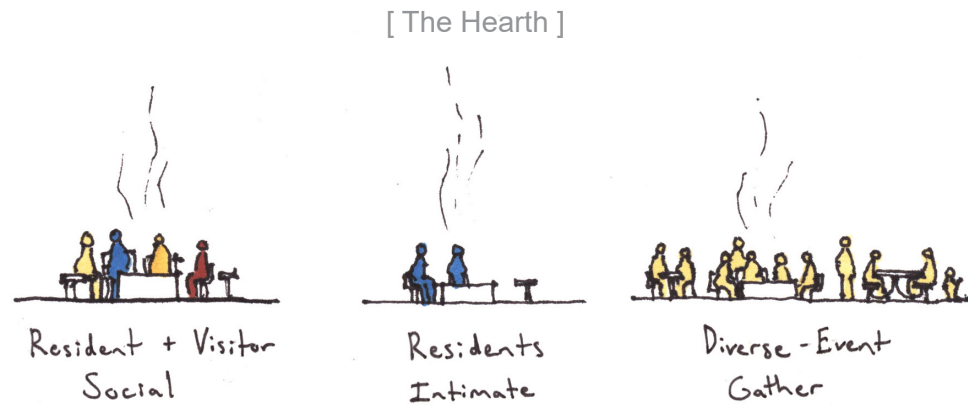


Fig. 26 - Hearth

The Courtyard

In and amongst the primary courtyard components are spaces for shelter and repose. As with the primary spaces, these supportive spaces must be able to accommodate a variety of user types and needs. The critical design strategy implemented across all courtyard spaces is “constructing a polyvalent architecture.”

Types of shelter vary along the public to private spectrum and, in many ways, also reinforce this gradient. As indicated previously, there is a reciprocal relationship between form and use as each influences the other. In this case, the form of the porch is much heavier and protective, reinforcing more private uses. Form as implemented by trees and movable seating offers protection while also opening up, reinforcing semi-public and semi-private use. Shelter around the lawn is much more limited, opening up and becoming much more public.

Repose is implemented across a gradient that undertakes the relationship of use and time of use. While certain types of seating lend themselves to periods of short usage, other seating arrangements are comfortable for longer usage. An example might be that a concrete curb or bench is comfortable for just a couple of minutes, while a table, or hearth seating arrangements with good shelter allow for gathering and longer periods of stay.

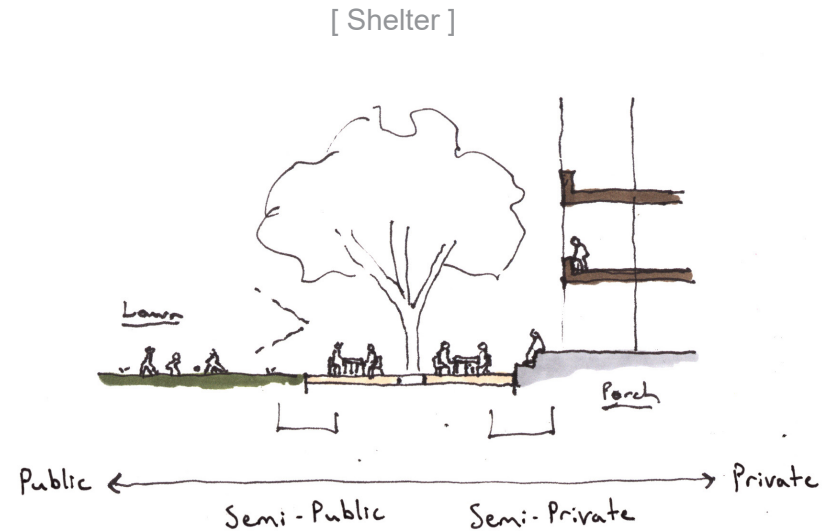


Fig. 27 - Shelter

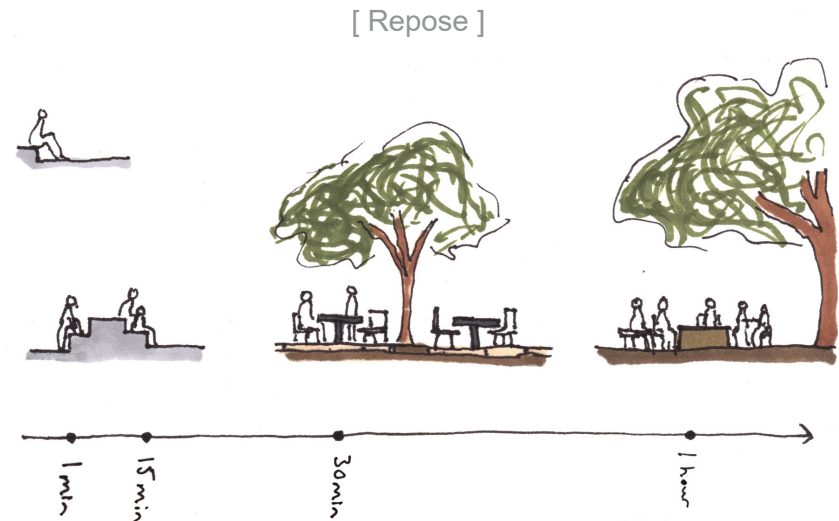


Fig. 28 - Repose

The Courtyard

These component parts are then brought together to inform the whole. The edge is defined first (figure 29). Then the component spaces, as outlined, are situated within the edge (figure 30). Routes are then drawn and used to understand access and travel in and around the component spaces (figure 32). These diagrams are then overlaid to understand an overall picture (figure 31). Lastly, form and texture are applied to fully realize the courtyard design (figure 33 on page 40).

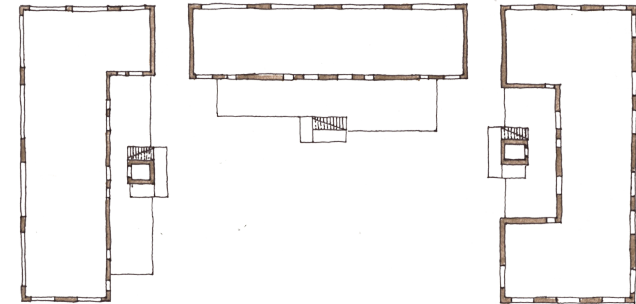


Fig. 29 - Edge

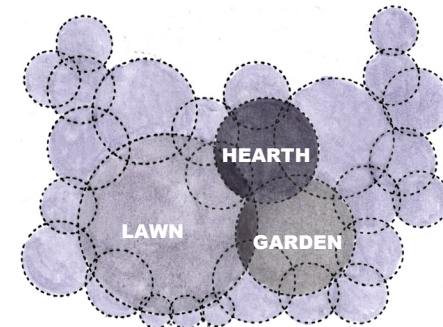


Fig. 30 - Spaces

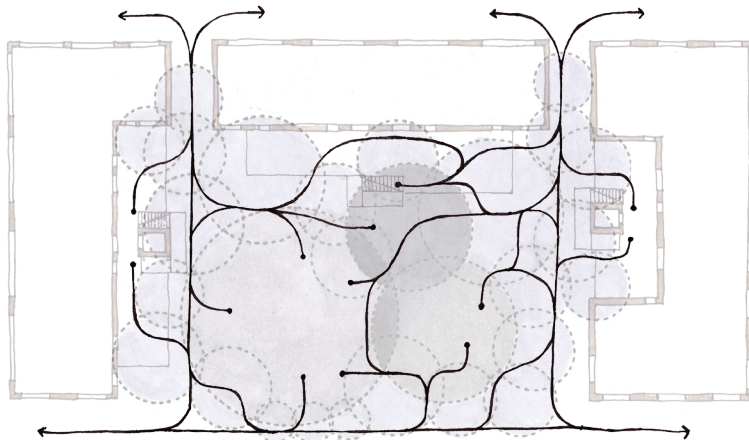


Fig. 31 - Courtyard Combination Series

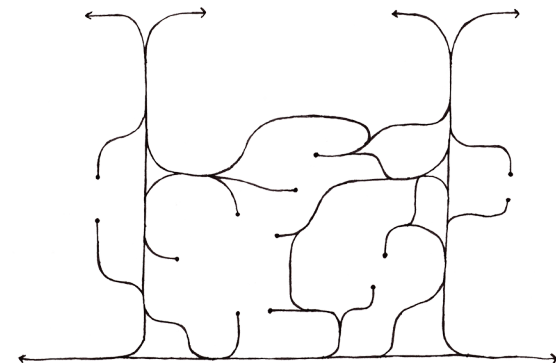


Fig. 32 - Paths

The Courtyard



Fig. 33 - Courtyard Plan



The Courtyard

Figure 34 depicts a perspective within the courtyard space. The lawn is shown segmented in a series that conceptualizes how the space could be used by a variety of users in different ways over time.



Fig. 34 - Use & User

Figure 35 - Courtyard Perspective
This perspective begins to show the relationship between, pedestrian path, courtyard, and the building.





The Building

As previously noted, the building can be oriented in a range of ways across 4 parcels of the block. In this example, the building is oriented with the courtyard facing south. This would likely be the most ideal orientation in order to maximize the courtyards access to light. However the courtyard area is large enough to be able to access ample light and air regardless of orientation.

As depicted here the building is three floors of residential situated above one floor of lofted live/work units. A fifth floor attic is built initially as a vacant shell. This fifth floor shell space could be turned into units over time as density is needed. Essentially extending the life-cycle of the building and allowing for change to occur over time.

Current low rise and 5-over-2 buildings around Seattle are being predominantly clad in HardiePanel and applying excessive facade modulation as a means to create a diverse street character. Though HardiPanel is cost effective and long lasting, there is simply too much of it being used in Seattle today. The result is quite the opposite of diverse facades. Instead, there is a shift to a homogeneous street character that dilutes the uniqueness of each urban village.

This design uses brick as the primary cladding for the exterior rain screen wall system. Brick offers a material that was once used extensively in Ballard. Masonry can still be seen on several buildings in Ballard dating to the early 20th century. Beyond a nod to Ballard's history, brick also offers a material that ages well over time. Furthermore the textural quality of brick limits the need for intense modulation. Simple concrete detailing is used for window sills, a first floor cornice and a parapet. This detailing establishes the necessary distinction of base, middle, and top in elevation (as can be seen in figure 38 and figure 39)



Fig. 36 - Building SW



Fig. 37 - Building NE



Fig. 38 - North Elevation



Fig. 39 - West Elevation

The Building

Live/work units occur only on the first floor, with commercial entrances fronting the street. The interior “work” space of these units is left unfurnished as each live/work resident would be able to shape the space to best fit their individual needs. These are live/with units, as there is no direct separation barrier between living and working. A spiral stair case offers access to lofted living spaces above.

Kitchens run adjacent to the courtyard facing side of each unit. This allows a window to be placed above the sink and offer views out to the porch and courtyard. The view from the sink is a small gesture with the potentially profound impact to better connect resident to place.

Not all units on the first floor need be live/work units. The east wing of the floor plan depicts typical units that will be stacked above on each floor. The building can be broken up into three or four units per wing allowing for a variety of unit sizes and unit types.

Residents enter their units via private entrances off of the courtyard. The porch and stair are used to access units above. This insures activation and use of the courtyard on a regular basis.

Porches on the first floor offer places for neighbors to gather, rest, and look out onto the courtyard. This acts much like the porch of a typical single family home with the benefit of being a space that three or four units share a sense of ownership over. The porch itself acts as a platform for a micro-community to manifest within each building wing. This then becomes the smallest scale of community within the larger scales of courtyard, block, and neighborhood community.



Fig. 40 - First Floor

The Building

The lofted level is situated directly above the kitchen and dining space on the first floor. This positioning allows the work space to be looked down at from the loft. The lofts allow residents a sense of privacy while also catering to a desired live/work lifestyle.

Beds could be simply placed on the lofted level unenclosed, however the option to enclose rooms on the lofted level is also viable. This is especially so if there are two or more occupants residing in one live/work loft. A small living or reading area sits adjacent to the bed space.

The live/work units allow for either a stacked bathroom both on first floor and loft level, or one bathroom situated on the first floor. Alternatively, a half bathroom may be used on the first floor with a full bathroom stacked on top to be used from the lofted level. Plumbing walls and mechanical shafts are stacked and run vertically up all floors.



Fig. 41 - Loft Level

The Building

Above the first floor are standard residential units. Similar to the first floor, each wing can take on three to four units depending on the unit size. Units are single-loaded and accessed from the porch. Each unit has at least one balcony. In some cases, each bedroom within a unit has access to a balcony. There is very limited use of interior unit corridors and rooms are accessed off of either the kitchen or living room areas. As in the live/work units, the majority of units have a window above the kitchen sink overlooking the porch and courtyard.

The single loaded layout has several benefits over it's double-loaded counterpart. The single loaded layout offers ample access to light and air and every unit gets a view out to the courtyard. A single-loaded scheme also allows for cross ventilation. Cross ventilation means less demand on mechanical air and cooling systems. Furthermore, this single loaded plan allows for neighbors to gather on the porch.

The porch itself can take on several uses. It can be a place for children to play, neighbors to meet, or simply a spot to rest and enjoy the last waning sunlight before the end of a long day. The porch is deep enough to provide comfort and shelter. The porch of each wing is bridged not only to provide a second means of egress, but also to allow for paths to cross and casual interactions to occur.

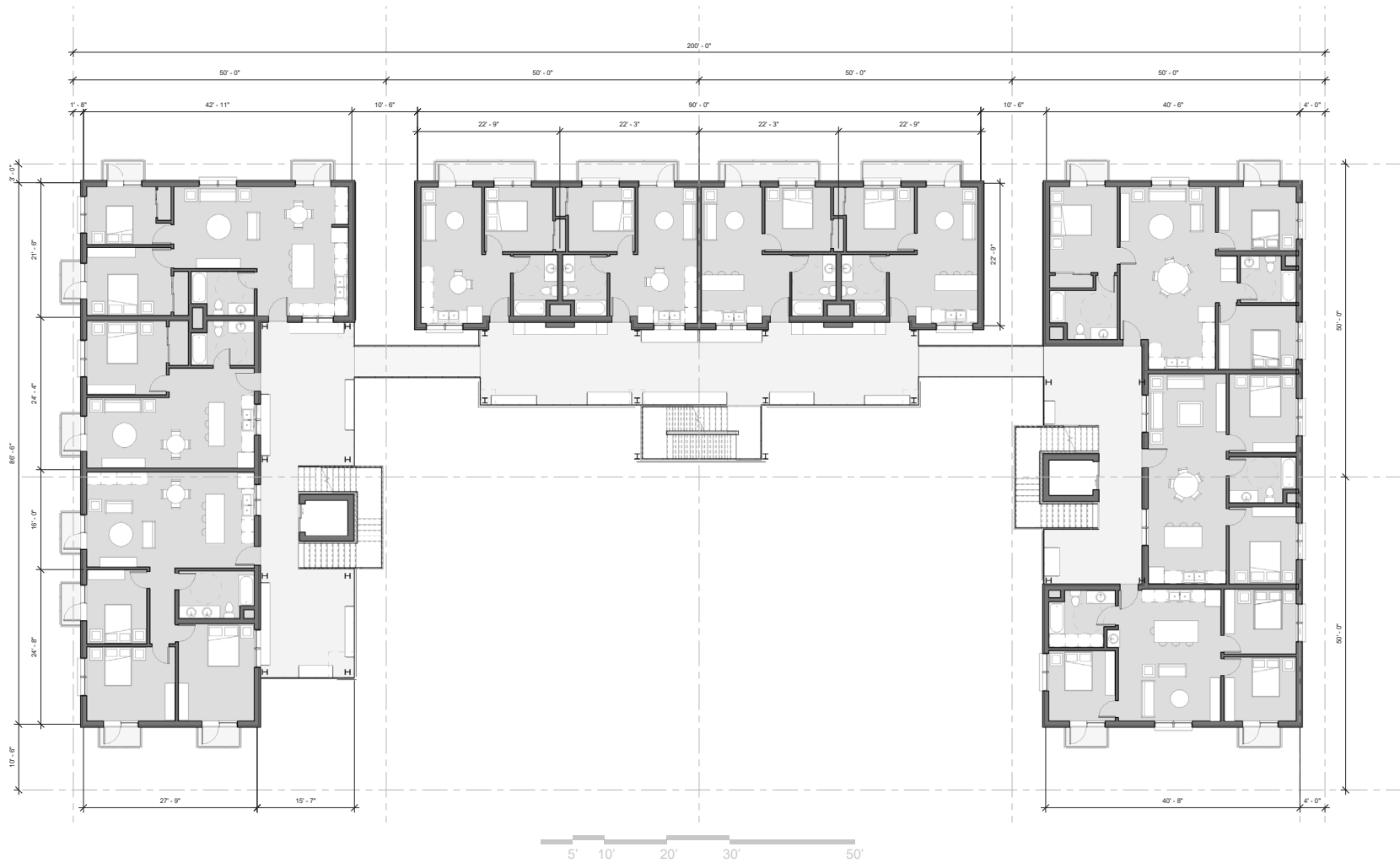


Fig. 42 - Second Floor

Threshold

In realizing this urban growth strategy, the threshold between parts plays a critical role. Analysis into these relationships was an important part of the alternative growth model development. The two diagrams below examine the courtyards relationship to the street (figure 43) and to the pedestrian path (figure 44).

Where as the threshold between street and courtyard is heavily defined by a full building depth, visibility and constructing a feeling of openness is the most critical factor to consider.

In quite the opposite regard, the threshold between pedestrian path and courtyard is very open and only loosely defined. This threshold demands a stronger edge that is still permeable.

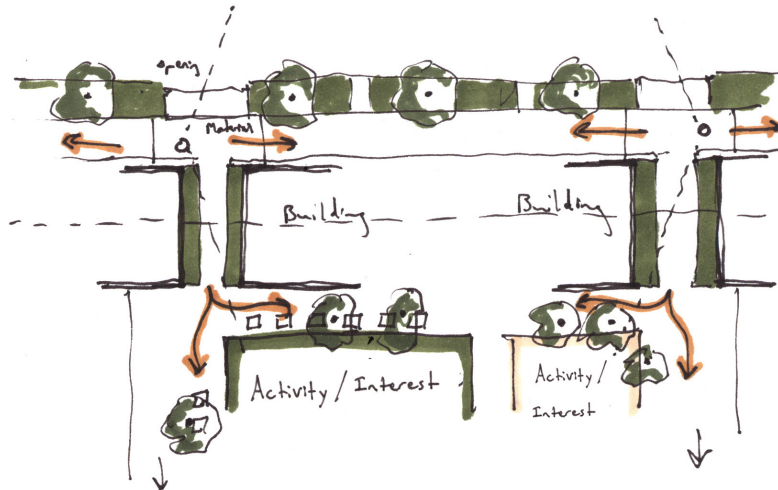


Fig. 43 - Threshold Street + Court / Visibility

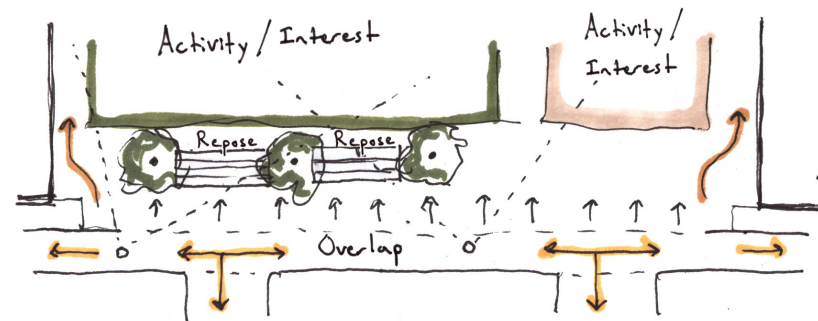


Fig. 44 - Threshold Path + Court / Permeable

Threshold

The porch is also a threshold. The porch acts as both part of the courtyard and part of the building. In this way, there is a soft transition between building and courtyard. Also in relation to the porch, vertical threshold must be considered. Figure 46 depicts Jan Gehl's assertion of social distance as applied to height.¹ While a connection remains between a person on the fifth floor and a person on ground level, there is complete disconnect after six stories.

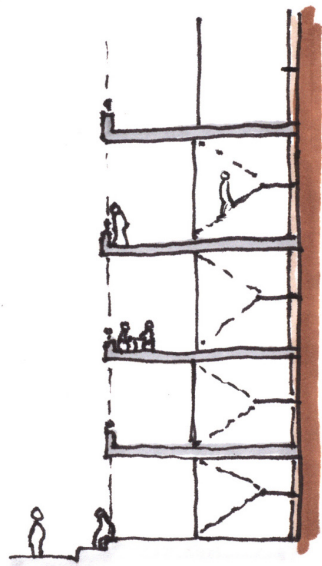


Fig. 45 - Porch

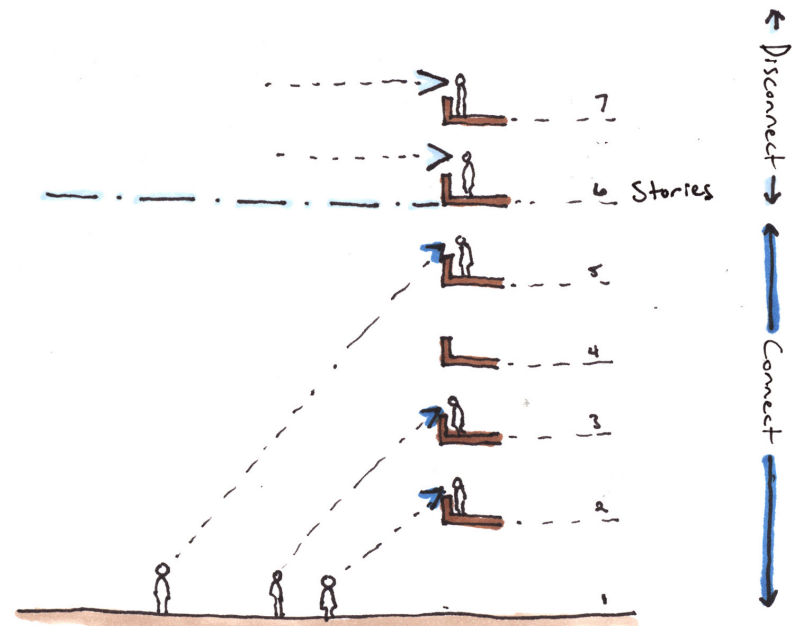


Fig. 46 - Height + Ground / Connection

¹ Gehl, Jan, and Birgitte Svarre, *How to Study Public Life* (Washington, D.C.: Island Press, 2013) 108-109.

Threshold

Threshold was initially studied in a series of perspectives at the human scale early on in the design process. These perspectives begin to show how form can shape threshold.

Figure 47 highlights the threshold between live/work unit and the street. The balcony of the residential unit above is used as a canopy for the entrance below. Polyvalent form defines the entrance while also providing space to sit, wait, meet. This form can also be used to set out plants and decoration to make for a more unique commercial entry.

Figure 48 depicts the entry from sidewalk into the courtyard. The path between buildings is composed of vines that crawl the building wall and make for a more lively entry. They signal it as a gateway. A small porch with fixed places to sit defines threshold to the unit.

Figure 51 illustrates how threshold between live/work and street became more fully realized in relation to a more fully developed building design. This sketch further illustrates the visibility to the courtyard from the sidewalk.



Fig. 47 - Threshold Perspective 1

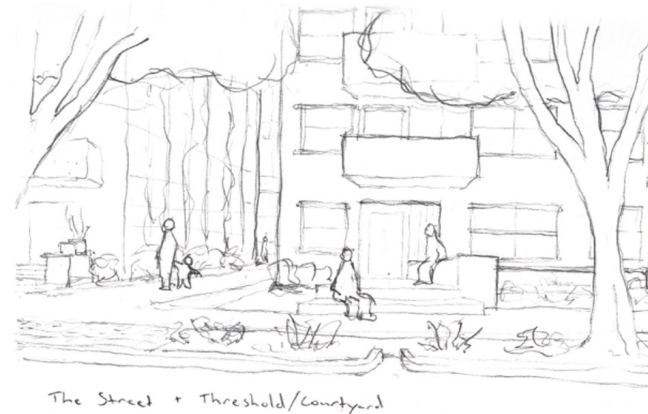


Fig. 48 - Threshold Perspective 2

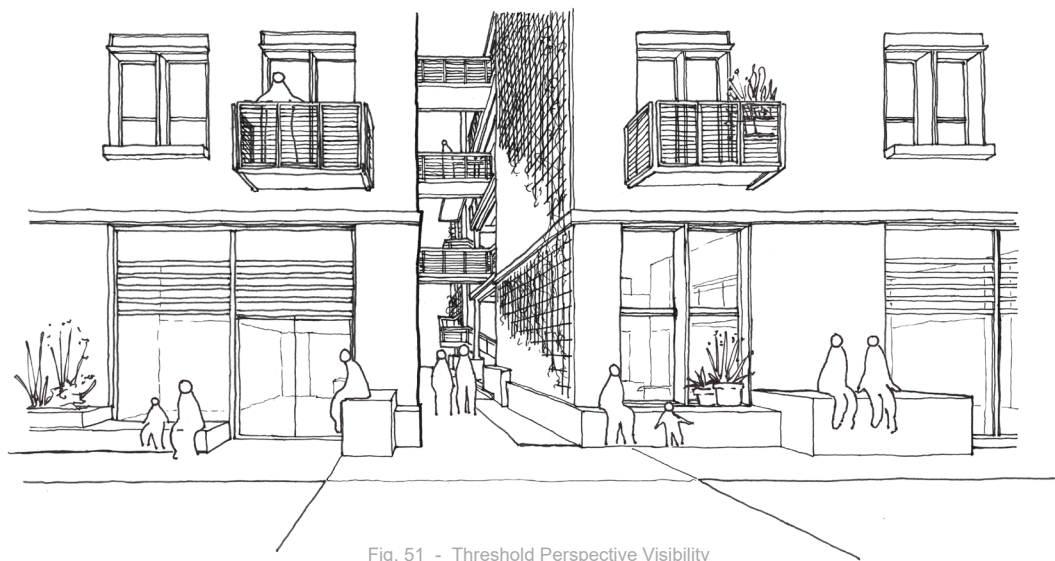


Fig. 51 - Threshold Perspective Visibility



Fig. 49 - Threshold 1



Fig. 50 - Threshold 2

Threshold

Figure 52 represents the initial conception of threshold between hearth and porch. This is more realized in figure 54 with an integrated porch and stair system extending partially into the hearth.

Figure 53 shows the initial threshold intent between the pedestrian path and the courtyard. This threshold is much more open, however an edge is defined by the simple placement of a concrete bench. This bench allows for those along the path to briefly rest, as well as those within the courtyard to sit on the benches opposite side. Tree placement and canopy is also seen here as a means to define edge and threshold.

Jan Gehl discusses the use of space as a self-reinforcing process in that - *“When someone is doing something, there is a clear tendency for others to join in.”*¹ Threshold must allow for perception of activity. This is why the visual connection from one component space to the next is so imperative. Activity inspires activity, while the absence of activity only inspires more absence.

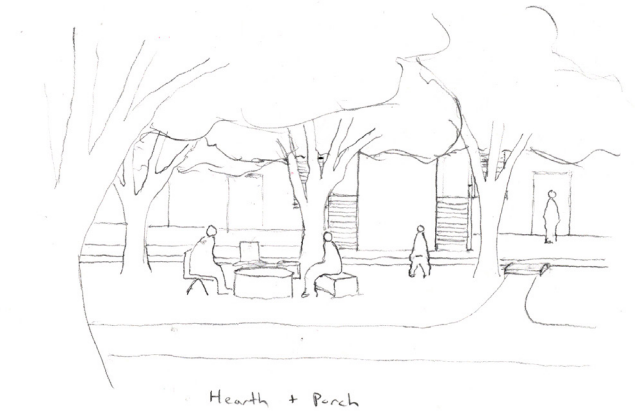


Fig. 52 - Threshold Perspective 3



Fig. 53 - Threshold Perspective 4

1 Jan Gehl, *Life Between Buildings: Using Public Space* (Copenhagen: Arkitektens Forlag, 1996), 73.

Threshold

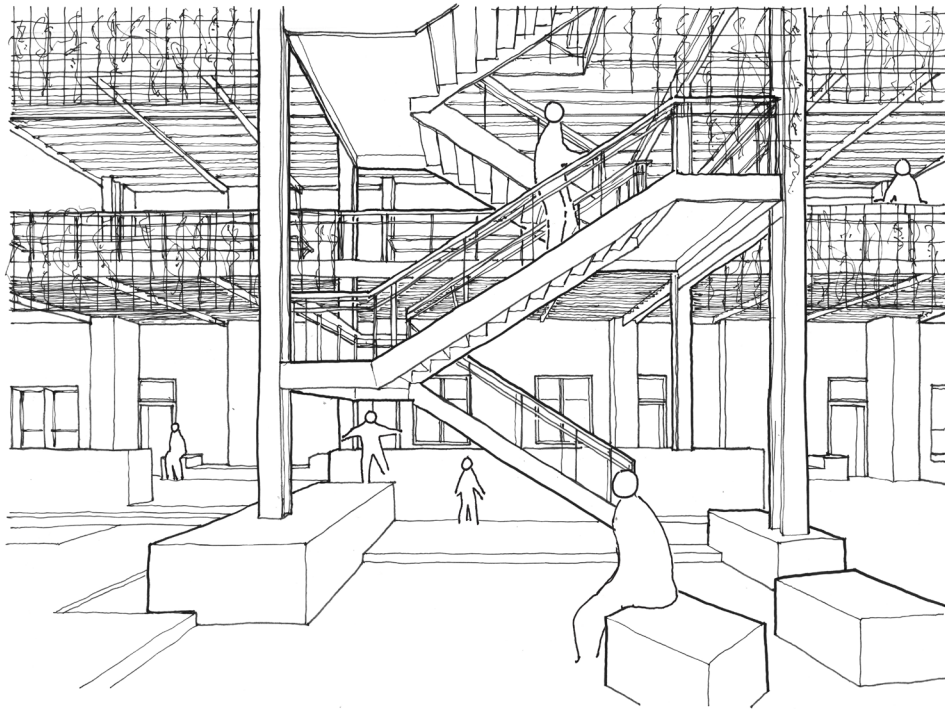


Fig. 54 - Threshold Perspective Integration



Fig. 55 - Threshold 3



Fig. 56 - Threshold 4

Figure 56 - Threshold Sectional Perspective
This illustration shows a range of thresholds explored across
the composed alternative growth model.





Quantitative Comparison

To better understand the specific quantitative effects of the alternative growth model, a comparison analysis looks at the relationship between single family, low rise, and the alternative courtyard model. The two most important variables to consider from this analysis are density and the total usable open space.

While four parcels are studied in this comparison, a similar analysis and design could be conceptualized for two or three parcel models. Total parcel square footage would remain the same for all three models, however in a three or four parcel model, the orientation of two parcels are rotated 90 degrees. In this way, the courtyard is on one parcel while the building wings are on the adjacent parcels.

The total density of each model was calculated as a units/acre metric. Floor area ratio (FAR) was also determined for each model. Assumptions were made, or ranges given to the total amount of units per floor, and the total amount of floors. These assumptions were based off of typical unit square footages, set backs, lot coverage, and height constraints. The numbers pertaining to each model can be seen on the following pages (62-64). The total usable open space was calculated by eliminating immediate building adjacent side yards.

Quantitative Comparison

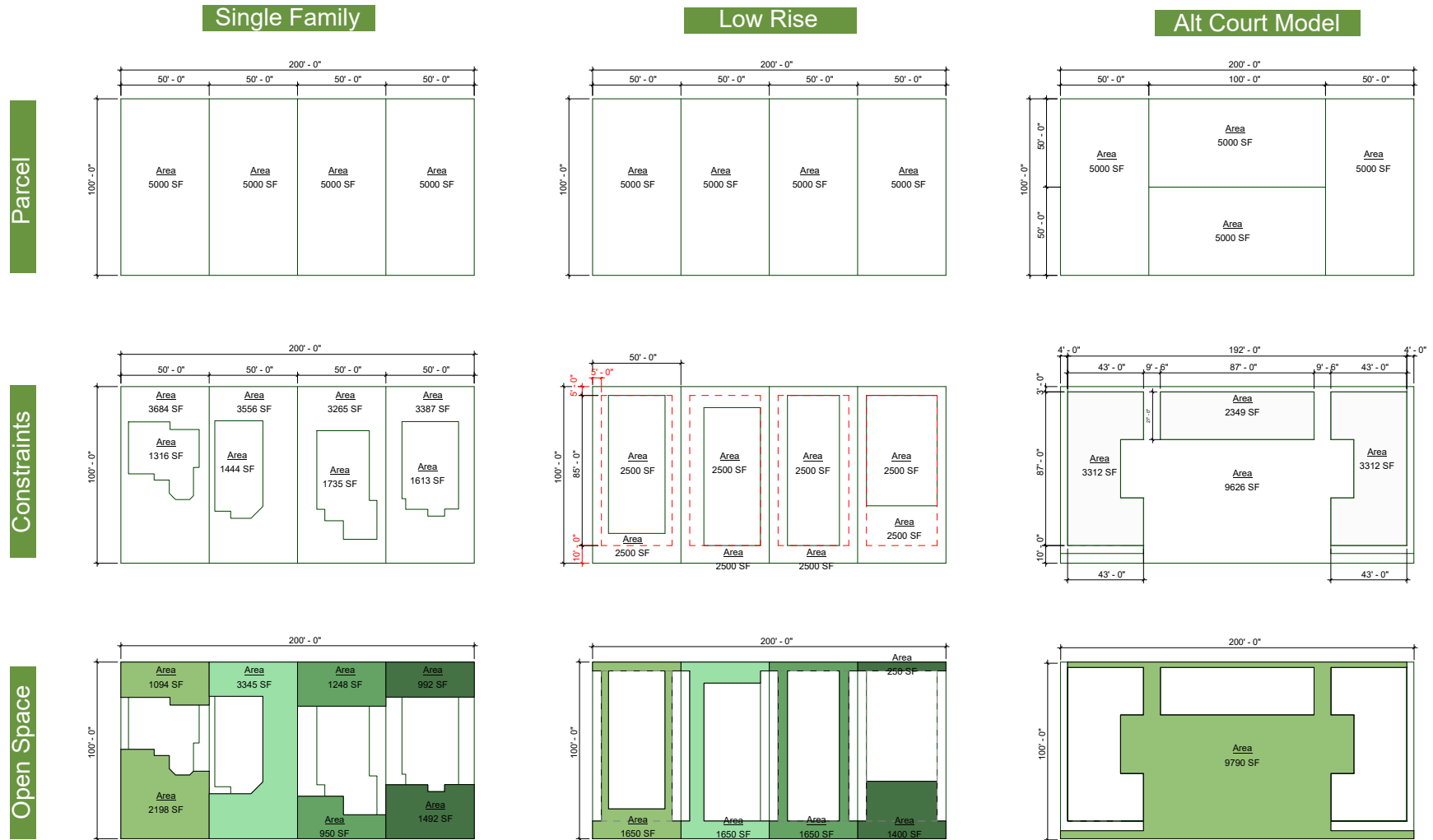


Fig. 58 - Model Comparison

Single Family Model

Seattle has an overwhelming amount of single family residential zoned land. Austin, Texas and San Jose, California are the only two cities in the United States that have both a higher population and a higher percentage of single family homes. Where 69% of Seattle's housing stock is single family homes, that figure is only 49% in San Francisco, 37% in Chicago, 14% in Boston, and just 1% in Manhattan.² The benefit of the single family model is its high degree of open space, what it lacks is density. A backyard is a major amenity, especially for families. However much of the open space goes to waste. Side yards can be virtually unusable. A 35% lot coverage dictates building size. Units/acre and total usable open space data can be seen in figure 60.

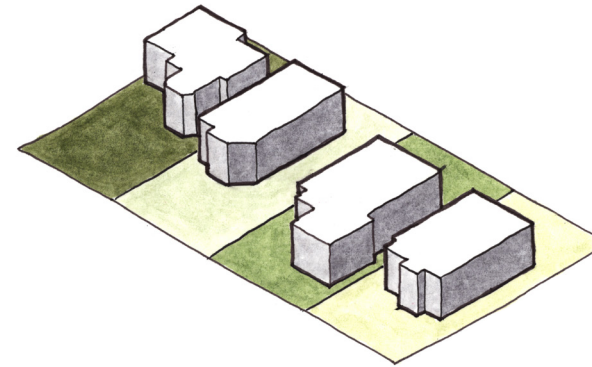


Fig. 59 - Single Family Model

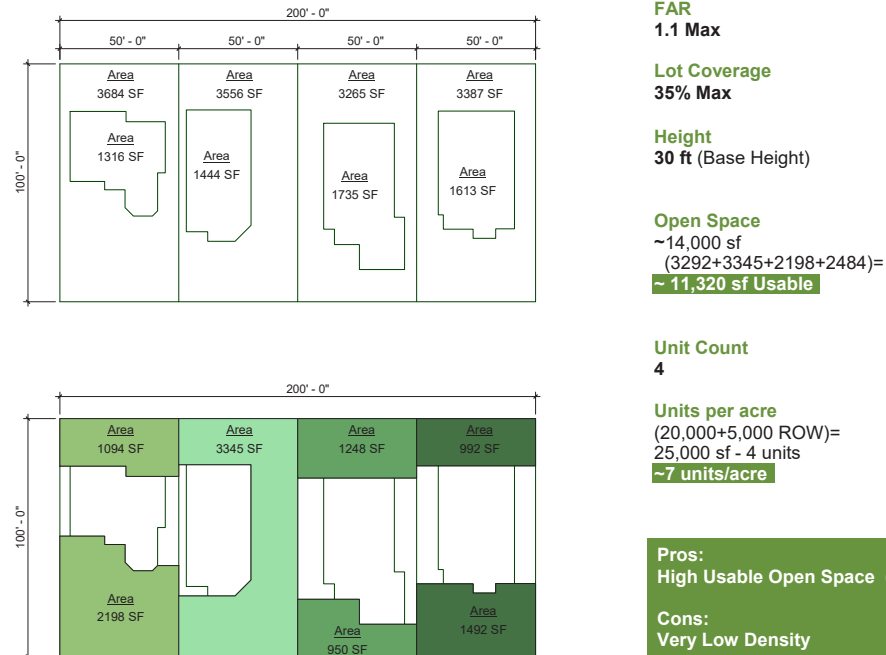


Fig. 60 - Single Family Quantitative



2 Mike Rosenberg, "Rapidly Growing Seattle Constrains New Housing Through Widespread Single-Family Zoning," *The Seattle Times*, May 3, 2018. <https://www.seattletimes.com/business/real-estate/amid-seattles-rapid-growth-most-new-housing-restricted-to-a-few-areas/>.

Low Rise Model

Low rise buildings in East Ballard are much less prevalent than single family homes. Side set backs from the lot line vary between 5-7' depending on building length. Front and rear setbacks are also imposed. The rear setback requires a minimum of 10' if there is an alley, and 15' if there is not an alley. Depending on unit size there are 3-4 units per building per floor. Across four parcels this would be a range of 12-16 units per floor. Floor Area Ratio (FAR) incentives can be achieved based on parking location and access, alley paving, and green building performance. The low rise model has the benefit of high density but with a downside of very low usable open space. Units/acre and total usable open space data can be seen in figure 62.

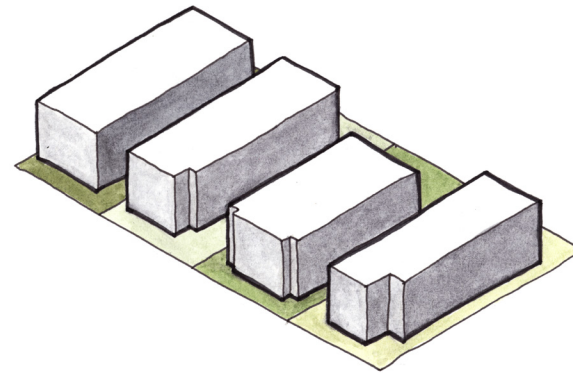
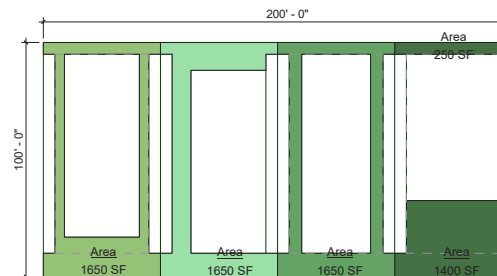
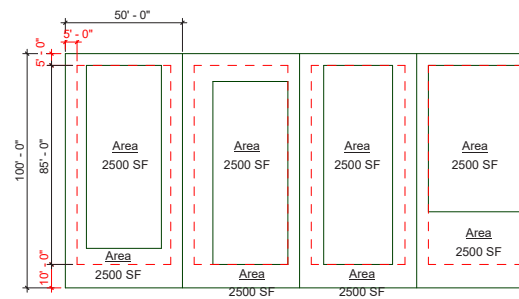


Fig. 61 - Low Rise Model



FAR (no incentives)
 2,500 sf * 3 Floors =
 7,500 sf
 /5000
 1.5

FAR (max incentives)
 2,500 sf * 4 Floors =
 10,000 sf
 /5000
 2.0

Height
 40' Max

Open Space
 ~ 10,000 sf
 1,650 sf * 4
~ 6,600 sf Max Usable

Unit Count
 (12 u/flr, 16 u/flr)
~36-48

Unit Count
 (12 u/flr, 16 u/flr)
~48-64

Units per acre
 (20,000+5,000 ROW) =
 25,000sf : 30-36 units
~62-84 units/acre

Units per acre
 (20,000+5,000 ROW) =
 25,000sf : 48-64 units
~84-110 units/acre

- Pros:**
 High Density
- Cons:**
 Very Low Usable Open Space (Private)

Fig. 62 - Low Rise Quantitative

Alternative Courtyard Model

The alternative courtyard model accommodates density while also ensuring a significant amount of usable open space.

Where the single family model has roughly 11,300sf of usable open space, the alternative model has roughly 9,800sf of publicly accessible and more efficient usable open space.

Where the low rise model ranges between 62-110 units per acre, the alternative model ranges between 52-104 units per acre.

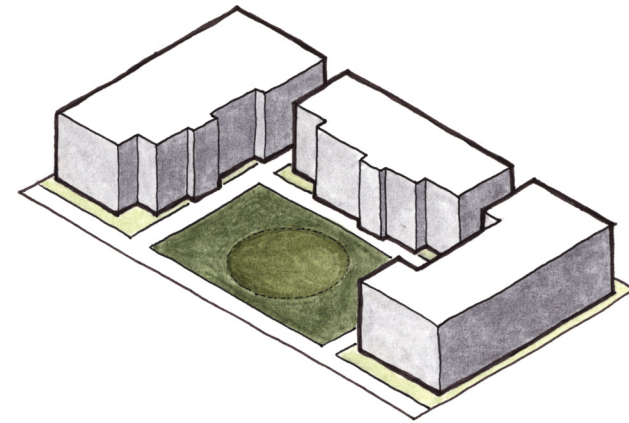
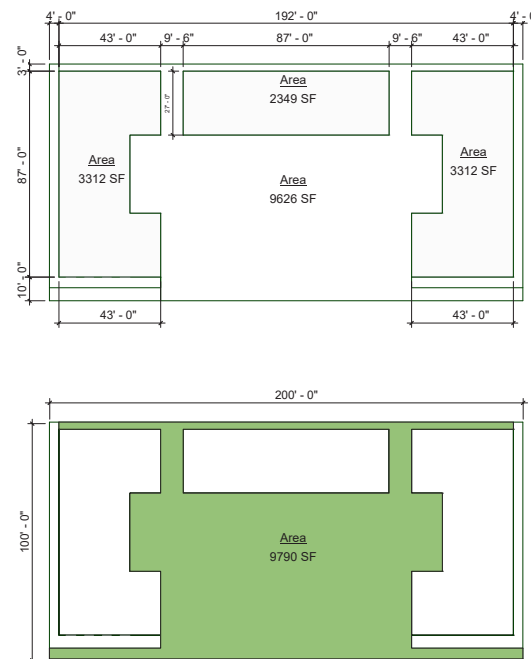


Fig. 63 - Courtyard Model Alternative



FAR
8,973 sf * 3 Floors=
26,919sf
/20000
1.34

Height
(10' ff Res, 12' ff Res)
35'-39'

Open Space
~ 11,000 sf
~ 9,790 sf Usable

Unit Count
(10 u/flr, 12 u/flr)
~30-36

Units per acre
(20,000+5,000 ROW)=
25,000sf : 30-36 units
~52-62 units/acre

FAR
8,973 sf * 4 Floors=
35,892 sf
/20000
1.79

Height
(10' ff Res, 12' ff Res)
45'-51'

Unit Count
(10 u/flr, 12 u/flr)
~40-48

Units per acre
(20,000+5,000 ROW)=
25,000sf : 40-48 units
~70-84 units/acre

FAR
8,973 sf * 4 Floors=
35,892 sf + (2,349*3)
/20000
2.14

Height
(10' ff Res, 12' ff Res)
55'-61'

Unit Count
(10 u/flr, 12 u/flr)
~50-60

Units per acre
(20,000+5,000 ROW)=
25,000sf : 50-60 units
~86-104 units/acre

Pros:
Adequate Density
Efficient Usable Open Space
(Publicly Accessible Private Space)

Fig. 64 - Courtyard Quantitative

05

Conclusion

Conclusion

In 1903 John Charles Olmsted was asked by the city to develop a plan for Seattle's parks system. Olmsted's strategy was to establish a series of parks interconnected by green boulevards that encompass the city's center. In 1908 the plan was expanded and coined "The Emerald Necklace."¹ This system was implemented over time and defines Seattle's successful parks and connecting boulevards still today. In its most basic form, this is an urban design strategy in which a series of interconnected open spaces wrap an urban center.

Though done at a neighborhood scale rather than a city scale, the alternative growth model outlined in this thesis is manifested in essentially the same way. Around each urban village edge pedestrian paths link a system of courtyard open spaces. The courtyards are analogous to the parks and the pedestrian paths are analogous to the green boulevards of Olmsted's plan, in affect becoming an "Emerald Bracelet." The intent of this thesis was never to replicate a design strategy similar to that of the Seattle parks system, rather research, analysis, design and the overall process led to a coinciding outcome. The structure of the design is built quite simply upon two things, the path and the courtyard model.

This thesis was presented to a panel of four jury members, experts in design and planning in Seattle. Senior urban designer and architect from Seattle's Office of Planning and Community Development,

Gary Papers, remarked on the design benefits of the courtyard model. Papers commented that, while the courtyard model has been quite extensively used in cities around the world, it has never been thoroughly adopted in Seattle. This statement is powerful in realizing the tremendous amount of precedent for the courtyard building model as represented in an urban context. It also prompts the question, "why has Seattle never adopted the courtyard?" Seattle's lack of embrace for the courtyard model may be more rooted in the city's underlying policy, zoning and building code structure. Indeed, much of the thesis jury's comment and discourse centered around how this alternative model could actually be implemented. Though thorough study into the logistical adoption of the growth model relatively exceeds the initial scope of this thesis, there are several strategies that could be explored.

One option is FAR and height incentives. In return for constructing a courtyard model, FAR incentives would allow developers to build more rentable square footage as means to make a greater profit. However, to ensure a greater degree of courtyard open-space, current maximum FAR restrictions may need to be lowered. FAR incentives are already used quite extensively in Seattle today as a means to control parking, alley paving, and green building performance.²

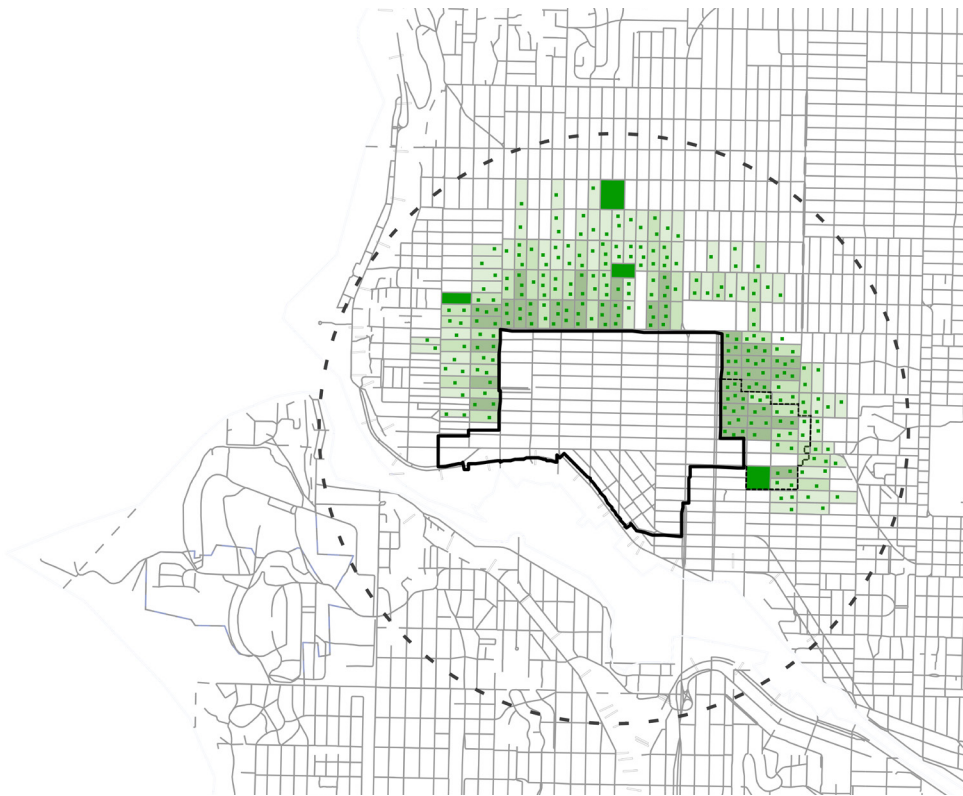


Fig. 65 - Urban Village Edge Growth

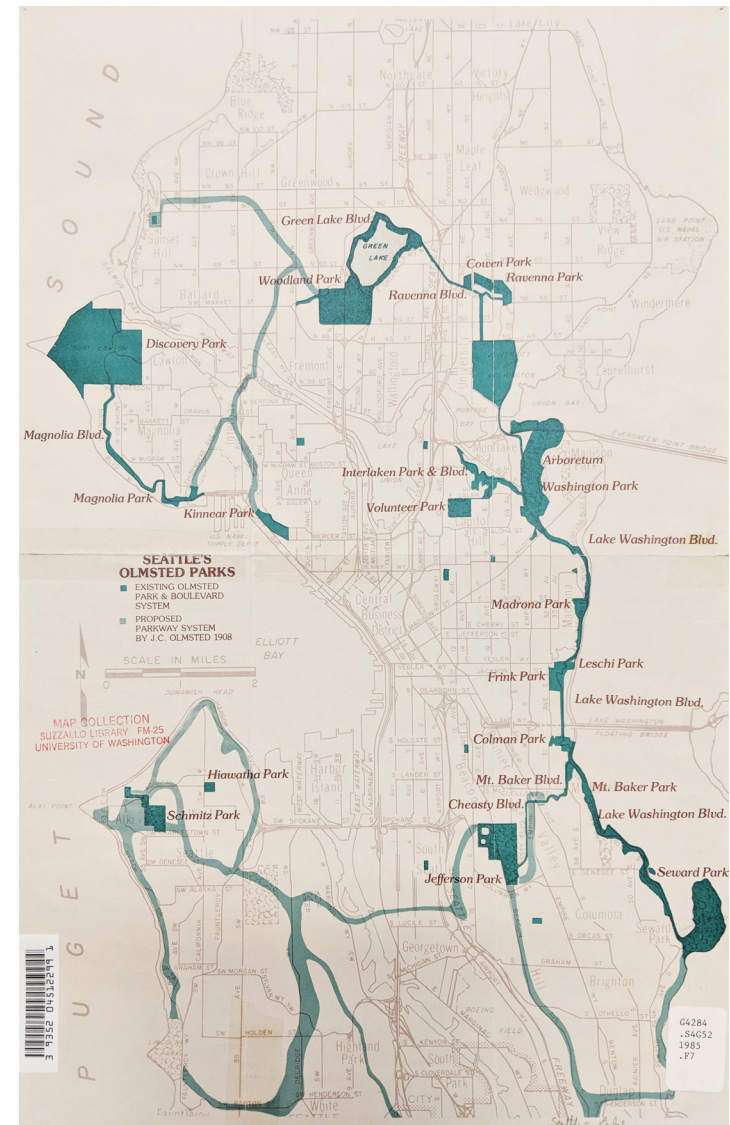


Fig. 66 - Olmsted Parks Map Seattle, UW Libraries

- 1 Hockaday, Joan. *GreenSpaces: Olmsted's Pacific Northwest* (Spokane: Washington State University Press, 2009), 42-52.
- 2 Seattle Department of Construction & Inspections. "Green Building Permit Incentives". Seattle.gov. Accessed June 6, 2018. <http://www.seattle.gov/dpd/permits/greenbuildingincentives/>

Another strategy, potentially in conjunction with FAR incentives, would be to consider several variations of the courtyard model. The model outlined in this thesis spans four parcels. In addition to the four parcel scheme, variations may be executed across two or three parcels as well. This would allow developers more options and a greater flexibility in the size and scale of their investment.

A more radical strategy is form-based code; defined by The Form-Based Codes Institute as follows:

“A form-based code is a land development regulation that fosters predictable built results and a high-quality public realm by using physical form (rather than separation of uses) as the organizing principle for the code. A form-based code is a regulation, not a mere guideline, adopted into city, town, or county law. A form-based code offers a powerful alternative to conventional zoning regulation.”³

As the alternative growth model is conceptualized through the form of courtyards and pedestrian paths, a code that defines form constraints could make the growth model possible. Form based code is built on the benefits of shape and form rather than the restrictions of zoning and land use.

All of these strategies offer points of further exploration when considering the alternative growth model moving forward. The growth model is intended not only to be a design, but a tool for discussion and this is a discussion that needs to be had. Seattle has backed itself into a corner and can no longer settle for immediate short term solutions. The alternative growth model outlined in this thesis offers a way forward. This is a long term, flexible solution to manage form and space, allowing for walkable urban communities.

3 Form-Based Codes Institute. “Form-Based Codes Defined”. Formbasedcodes.org.



06

Appendix

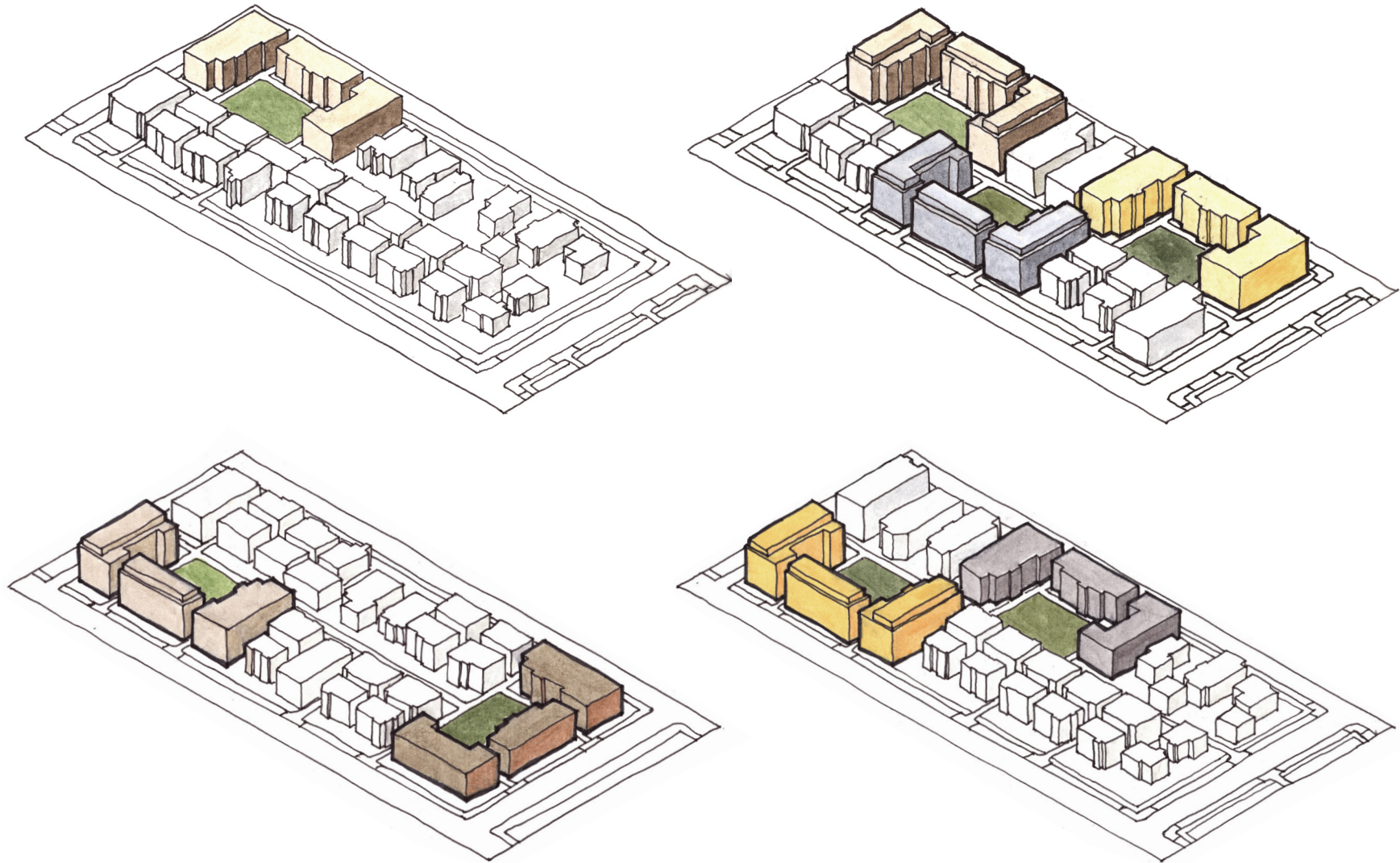


Fig. 67 - Example Block Configurations

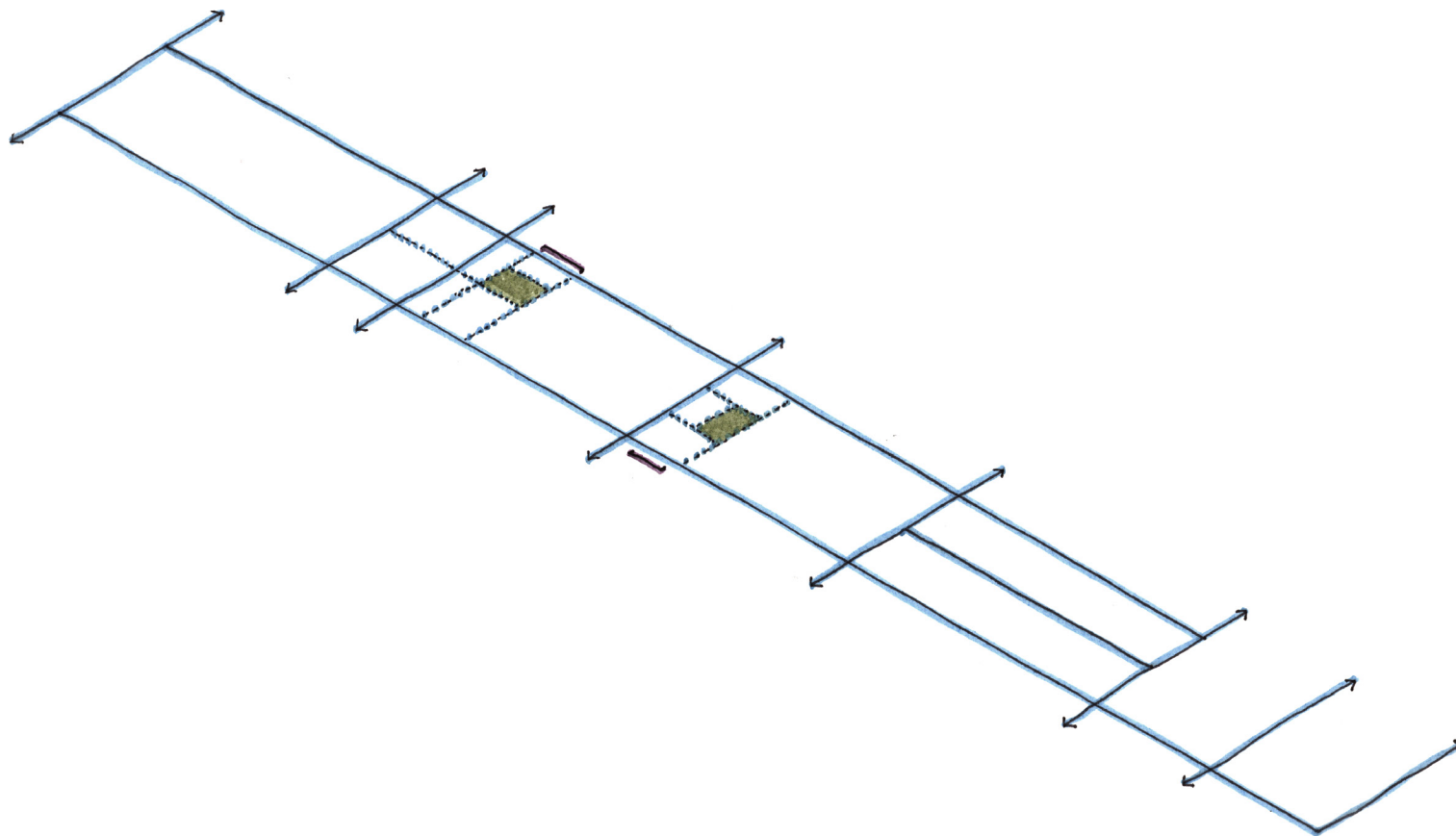


Fig. 68 - Transect Diagram Incremental 1

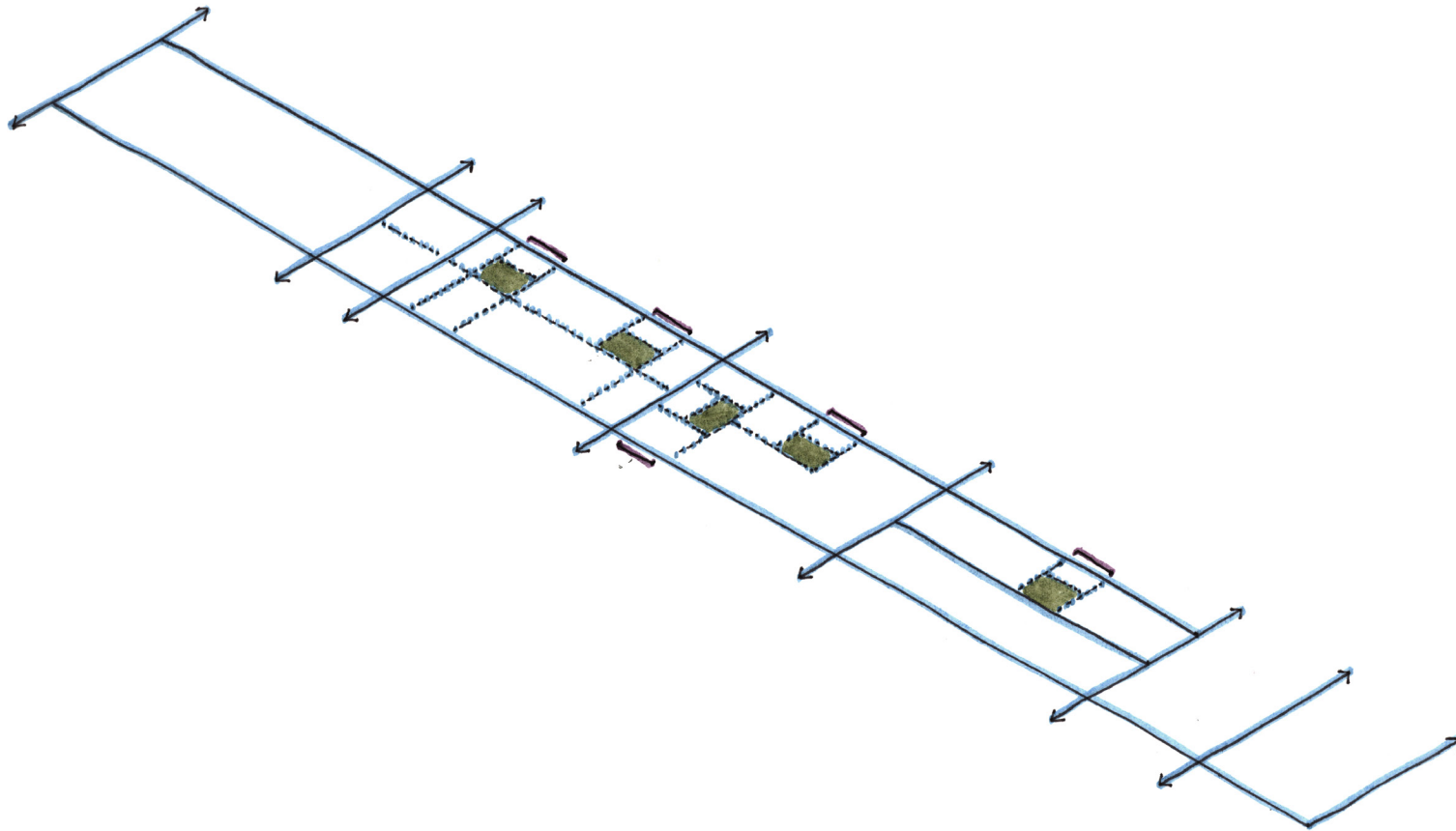


Fig. 69 - Transect Diagram Incremental 2

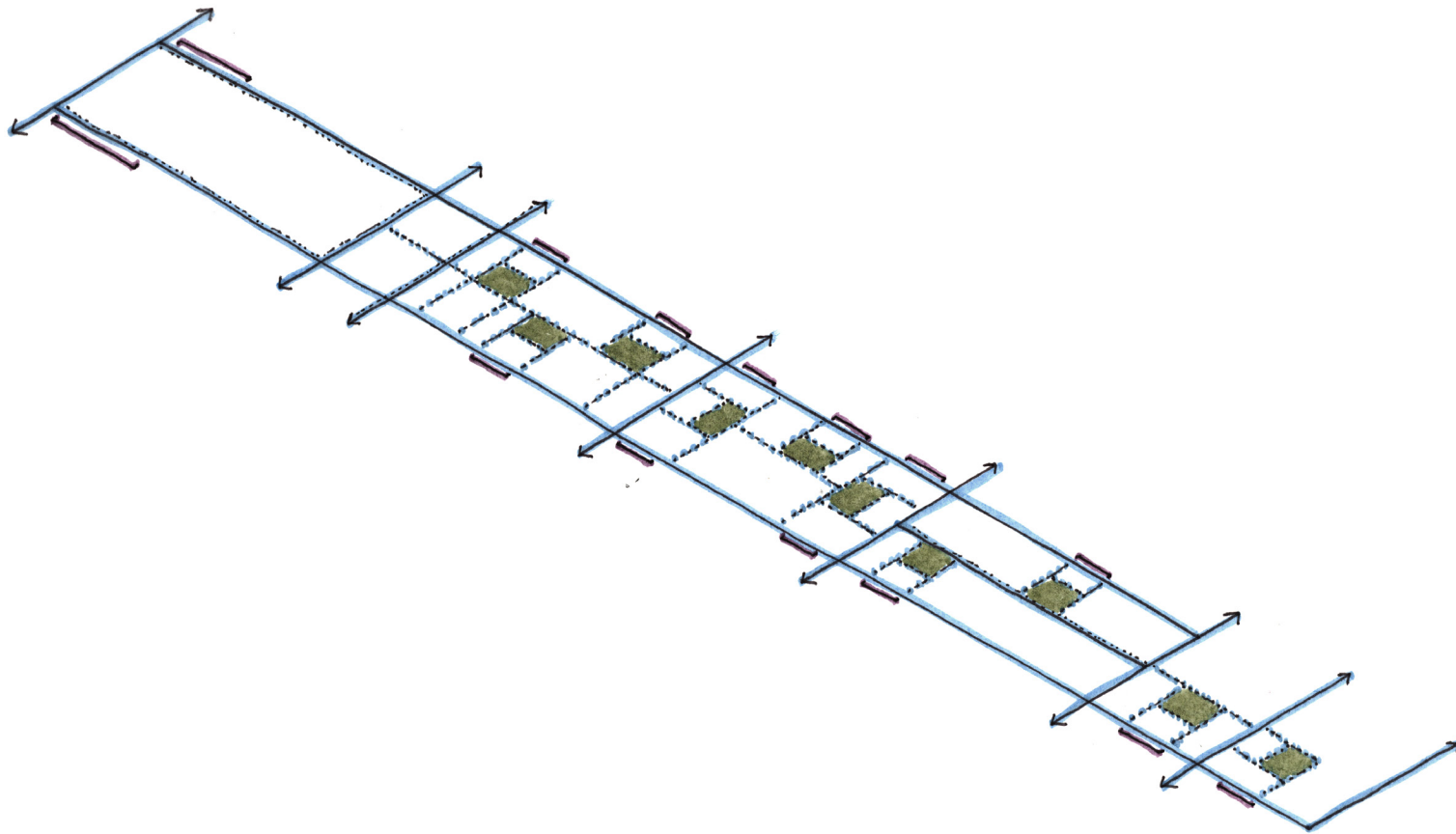


Fig. 70 - Transect Diagram Incremental 3

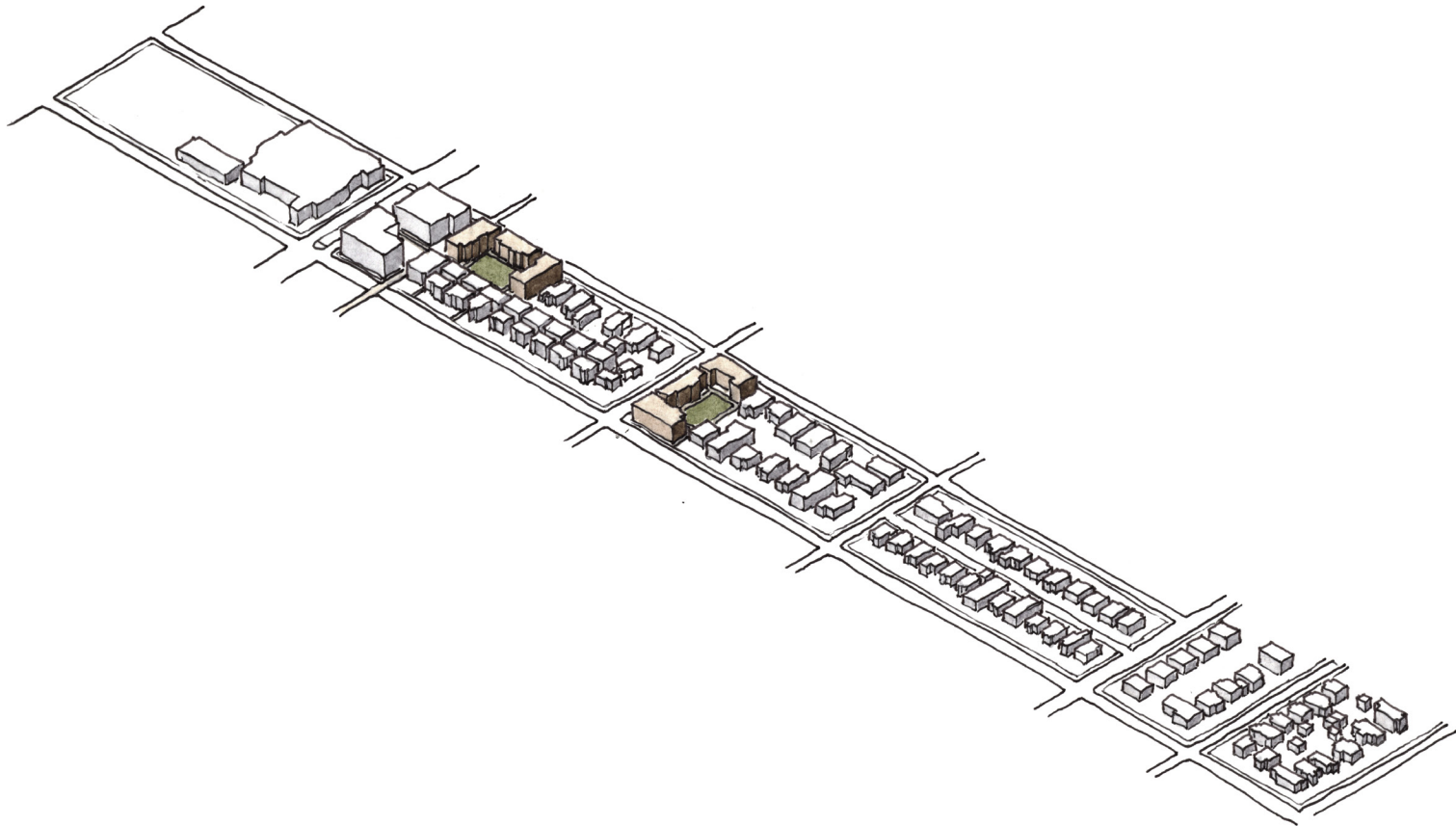


Fig. 71 - Transect Massing Incremental 1

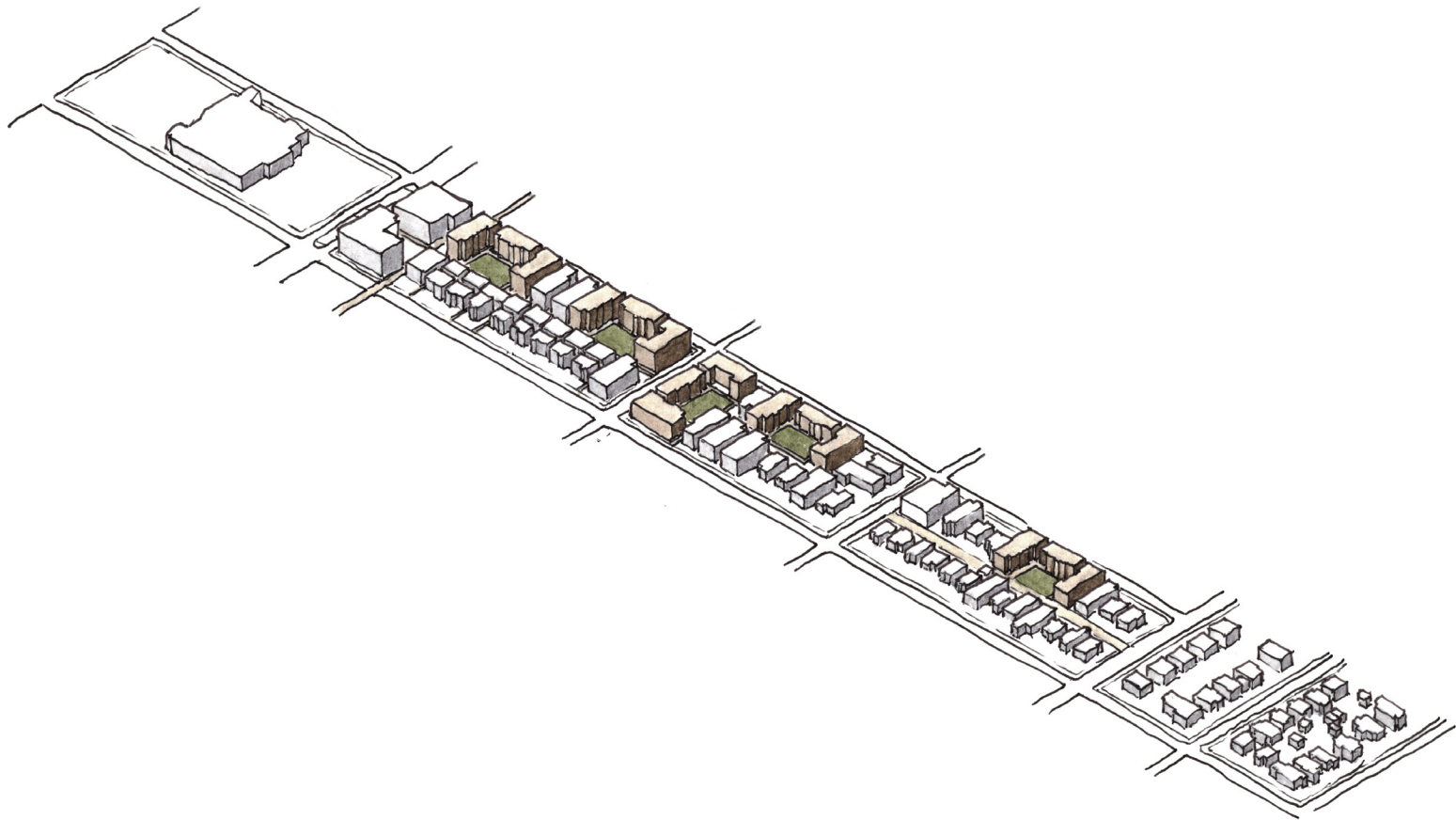


Fig. 72 - Transect Massing Incremental 2

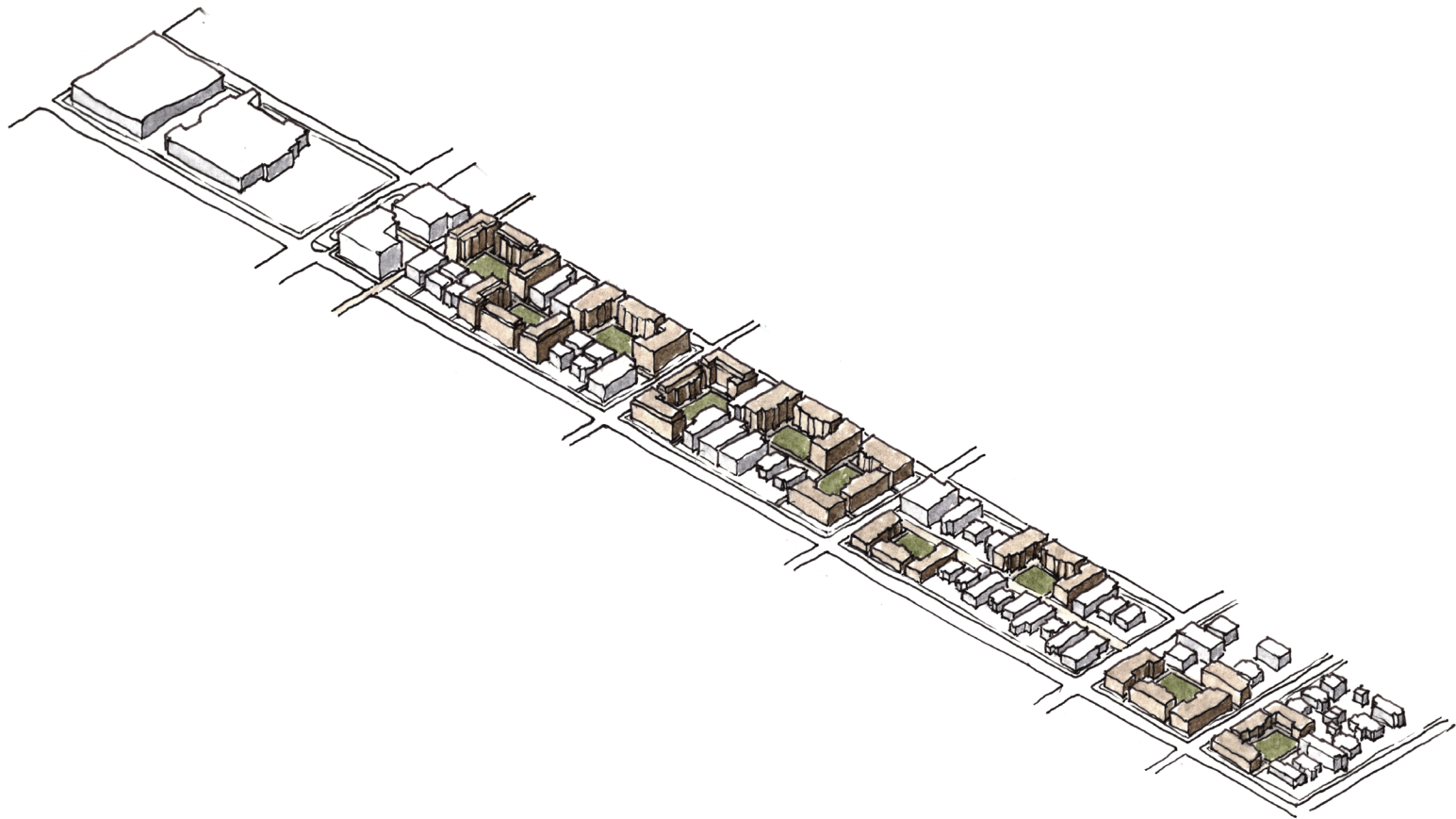


Fig. 73 - Transect Massing Incremental 3

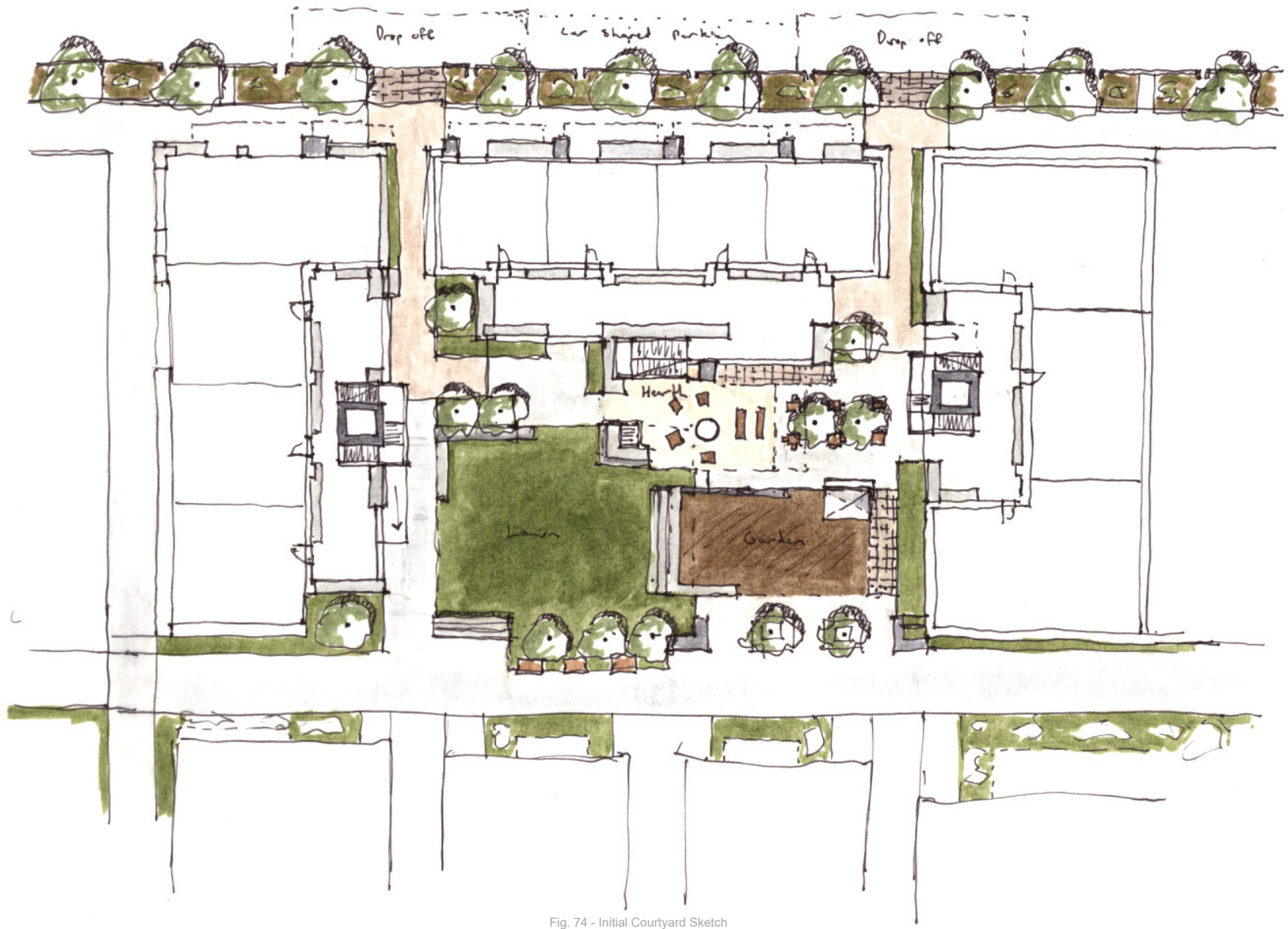


Fig. 74 - Initial Courtyard Sketch



Fig. 75 - Initial Pedestrian Path Sketch

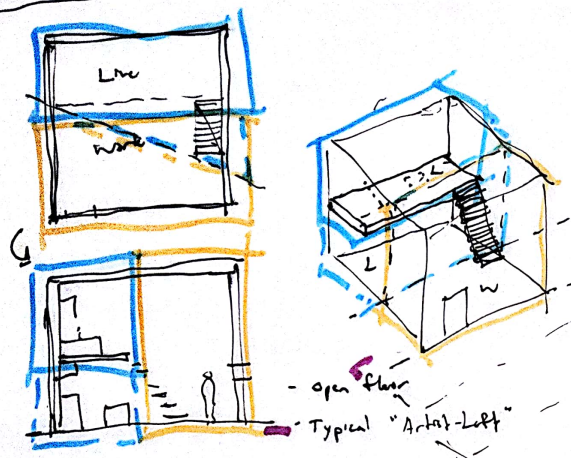


Fig. 76 - Courtyard Elevation Perspective Sketch

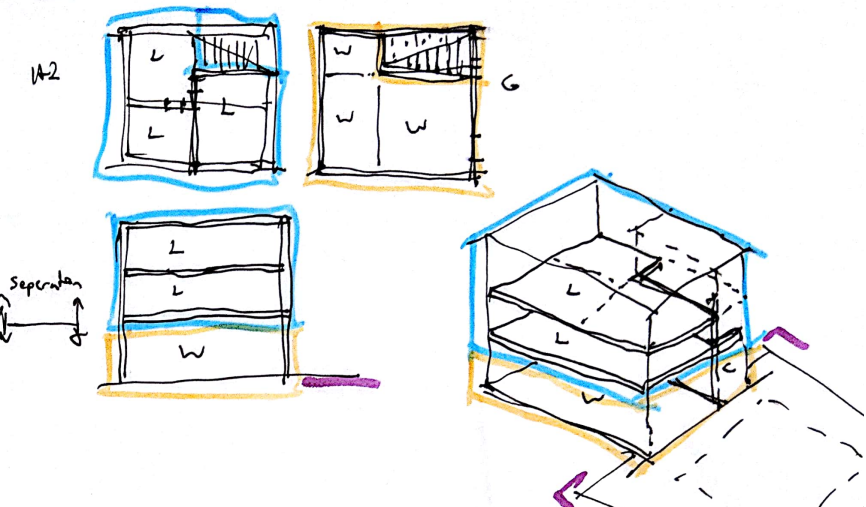


Fig. 77 - Threshold Sectional Perspective Sketch

Live-With



Live Near



Live Nearby

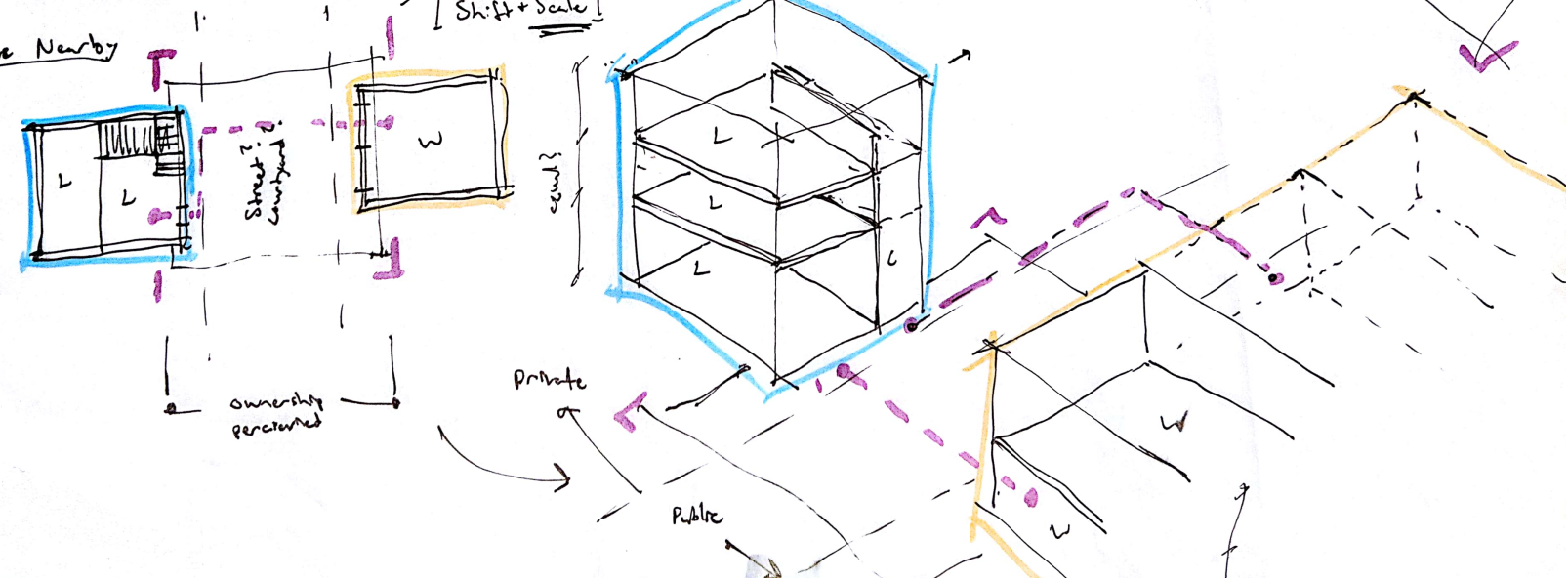
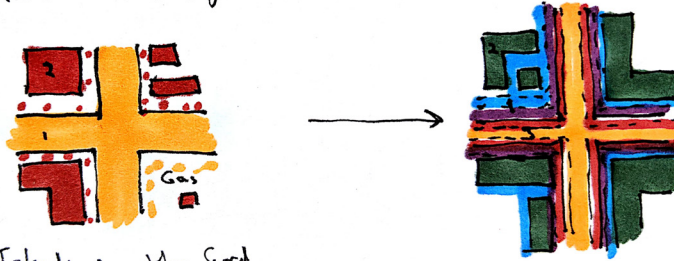


Fig. 78 - Live/Work Sketch

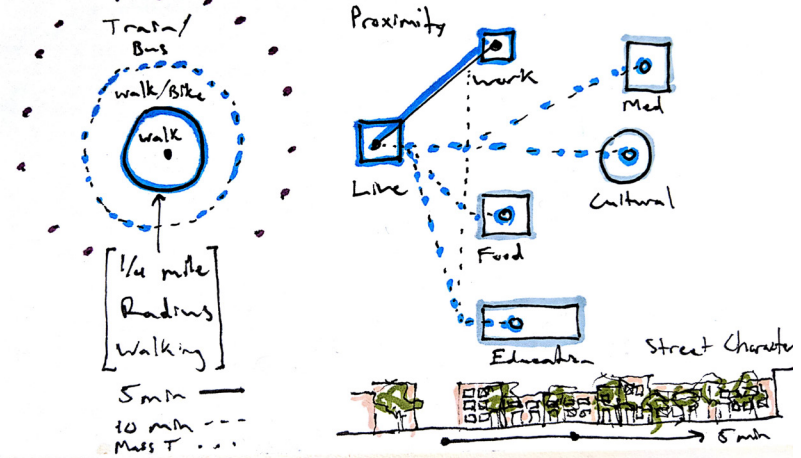
[Hierarchy]

What is the Most Dominant Form Currently

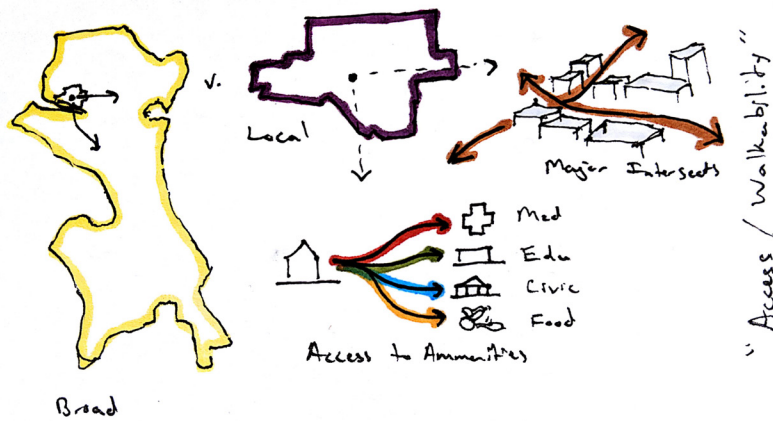


- Islands in the Grid
- Indifference to the Street

[Walkability]



[Site Selection Matrix] - Connectivity



[Site Selection Matrix]

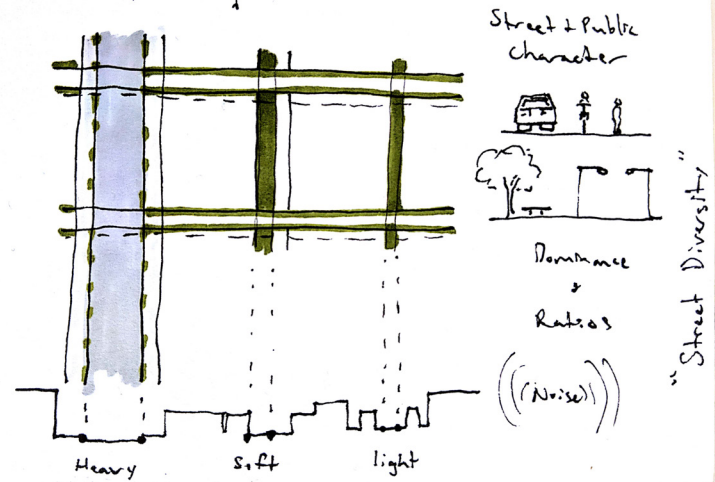
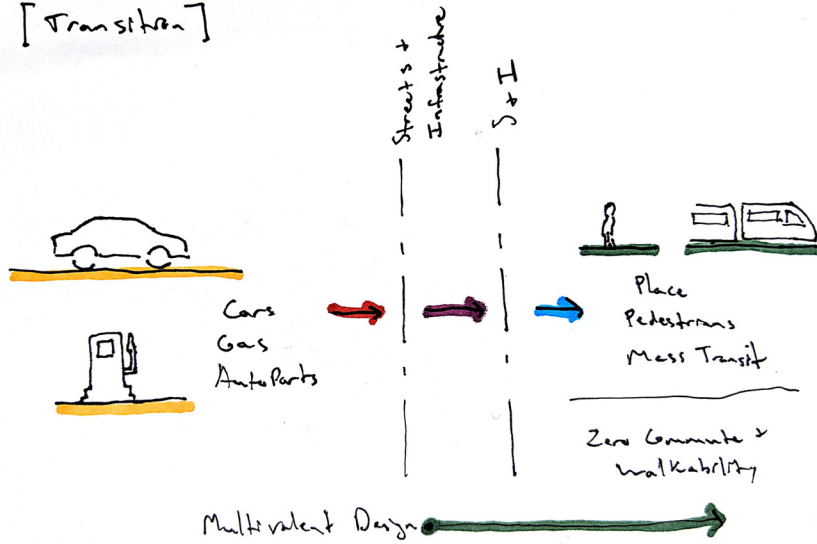


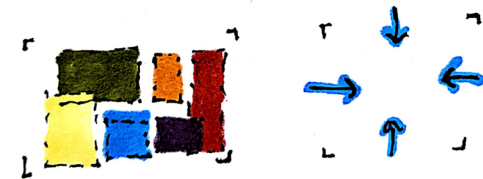
Fig. 80 - Notecards 1

[Transition]

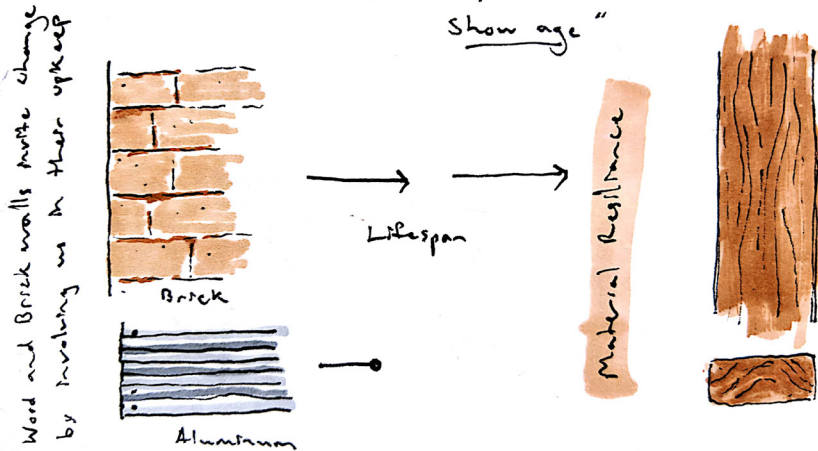


[Ownership]

"The architect can contribute to creating an environment which offers for more opportunities for people to make their personal markings and identifications, in such a way that it can be appropriated & owned by all as a place that truly "belongs" to them"



[Materiality] "Traditional materials like brick, stone, stucco, slate, and wood show age"



[Social Distances]

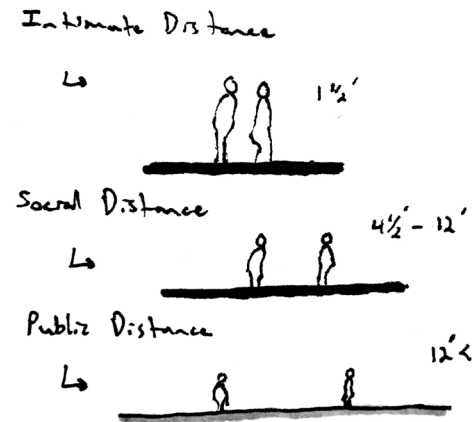


Fig. 81 - Notecards 2

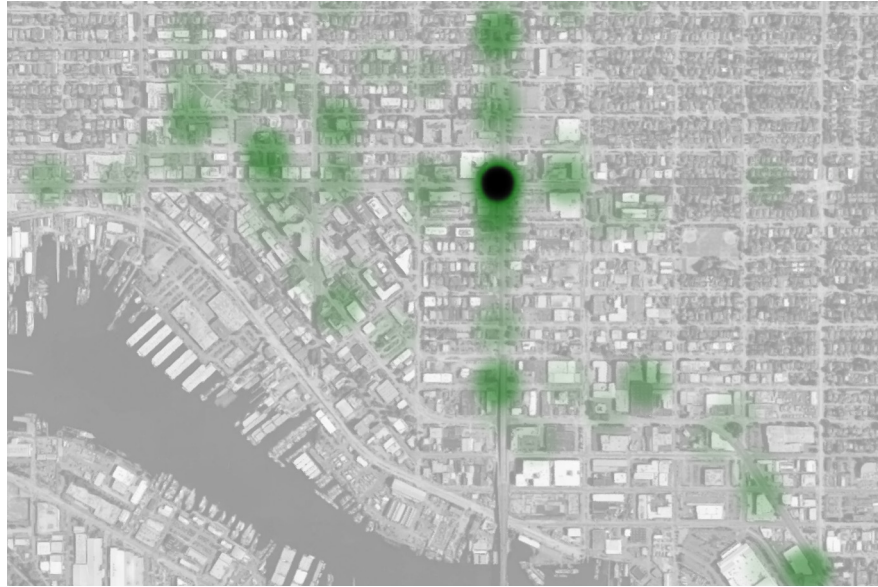


Fig. 82 - Pedestrian Collision Heat Map Eastern Ballard, Seattle Department of Transportation

Housing Types:

Development standards apply according to the following housing types: cottage housing, rowhouses, townhouses or apartments.

See SMC 23.84.032 for complete housing type definitions.

Cottage Housing



Individual cottage house structures are arranged around a common open space. 950 SF is the maximum size allowed for each cottage.

Rowhouse



Rowhouses are attached side by side along common walls. Each rowhouse directly faces the street with no other principal housing units behind the rowhouses. Rowhouses occupy the space from the ground to the roof. Units can not be stacked.*

Townhouse



Townhouses are attached along common walls. Townhouses occupy the space from the ground to the roof. Units can not be stacked. Principal townhouse units may be located behind other townhouses units as seen from the street.*

Apartments



Multifamily housing that is not cottage housing, rowhouses, or townhouses is considered apartments. Apartment units may be stacked.

LR1 - Lowrise 1

The LR1 zone provides a transition between single family zoned areas and more intense multifamily and commercial areas. LR1 is most appropriate for areas outside of Growth Areas***. A mix of housing types similar in scale to single family homes such as cottages, rowhouses and townhouses are encouraged.

Floor Area Ratio (FAR)**	1.1	1.0 or 1.2	0.9 or 1.1	1.0
Density Limit**	1 unit / 1,600 SF lot area	1 unit / 1,600 SF lot area on lots less than 3,000 SF All others: No Limit	1 unit / 2,200 SF or 1 unit / 1,600 SF lot area	1 unit / 2,000 SF lot area (duplexes and triplexes only)
Building Height	18' + 7' for a roof with minimum 6:12 pitch	30' + 5' for roof with minimum 6:12 pitch	30' + 5' for roof with minimum 6:12 pitch	30' + 5' for roof with minimum 6:12 pitch
Building Setbacks	Front: 7' Average, 5' minimum Rear: 0' with Alley, 7' no Alley Side: 5' minimum	Front: 5' minimum Rear: 0' with Alley, 7' average, 5' minimum Side: *	Front: 7' Average, 5' minimum Rear: 7' Average, 5' minimum Side: 5' if building is 40' or less in length, or 7' Average 5' min.	Front: 5' minimum Rear: 10' minimum with Alley, 15' minimum no Alley Side: 5' if building is 40' or less in length, or 7' Average 5' min.
Building Width Limit	60'	60'	60'	45'
Max. Facade Length	Applies to all: 65% of lot depth for portions within 15' of a side lot line that is not a street or alley lot line, and 40' for a rowhouse unit located within 15' of a lot line that abuts a lot in a single family zone.			
SDR	Optional	Optional * 0' where abutting another rowhouse, otherwise 3.5', except when abutting a single-family zone, the setback is 5'	Required for 3 or more units	Optional

LR2 - Lowrise 2

The LR2 zone provides for a variety of multifamily housing types in existing multifamily neighborhoods and along arterial streets. LR2 is most appropriate for areas within Growth Areas***. A mix of small scale to multifamily housing such as townhouses, rowhouses and apartments are encouraged.

Floor Area Ratio (FAR)**	1.1	1.1 or 1.3	1.0 or 1.2	1.1 or 1.3
Density Limit**	1 unit / 1,600 SF lot area	No Limit	1 unit / 1,600 SF lot area or No Limit	1 unit / 1,200 SF or No Limit
Building Height	18' + 7' for a roof with minimum 6:12 pitch	30' + 5' for roof with minimum 6:12 pitch	30' + 5' for roof with minimum 6:12 pitch	30' + 5' for roof with minimum 6:12 pitch or 30' + 4' for partially below grade floor
Building Setbacks	Same as LR1	Same as LR1	Same as LR1	Same as LR1
Building Width Limit	Not applicable	No Limit	90'	90'
Max. Facade Length	Applies to all: 65% of lot length for portions of facades within 15' of a lot line that is not a rear, street or alley lot line, and 40' for a rowhouse unit located within 15' of a lot line that abuts a lot in a single family zone.			
SDR	Optional	Optional	Required for 3 or more units	Optional

LR3 - Lowrise 3

The LR3 zone provides for a variety of multifamily housing types in existing multifamily neighborhoods of moderate scale. LR3 accommodates residential growth primarily within Growth Areas***. A mix of small to moderate scale multifamily housing is encouraged including apartments, townhouses and rowhouses.

			Growth Areas***	Outside Growth Areas***	Growth Areas***	Outside Growth Areas***
Floor Area Ratio (FAR)**	1.1	1.2 or 1.4	1.2 or 1.4	1.1 or 1.3	1.5 or 2.0	1.3 or 1.5 (1.6 on a street with frequent transit)
Building Height	18' + 7' for a roof with minimum 6:12 pitch	Rowhouses and Townhouses: 30' + 5' for roof with min. 6:12 pitch and +4' for partially below grade floor; or +10' for roof with min. 6:12 pitch (no height added for below-grade floor). Note: In some cases development is limited to 3 or 4 stories above grade in addition to the height limit (also applies to apartments).			40' 30'	+5' for roof with min. 6:12 pitch; or +4' for partially below-grade floor; 30' limit if within 50' of a single family zone.
Density Limit**	1 unit / 1,600 SF lot area	No Limit	1 unit / 1,600 SF lot area or No Limit		1 unit / 800 SF lot area or No Limit	
Building Setbacks	Same as LR1	Same as LR1	Same as LR1		Same as LR1	
Building Width Limit	No Limit	No Limit	120' Outside growth areas, 150' Inside growth areas		120' Outside growth areas, 150' Inside growth areas	
Max. Facade Length	Applies to all: 65% of lot depth for portions within 15' of a side lot line that is not a street or alley lot line, and 40' for a rowhouse unit located within 15' of a lot line that abuts a lot in a single family zone.					
SDR	Optional	Optional	Required for 3 or more units		Optional	

* Accessory Dwelling Units (ADUs) are allowed and don't count against the density limit that applies to these housing types.

** The higher FAR and density limits apply if the project meets additional standards regarding parking location and access, alley paving, and green building performance (SMC 23.45.510.C).

*** Growth Areas include urban centers, urban villages, and station area overlay districts.

Fig. 83 - Low Rise Zoning Seattle, City of Seattle



Fig. 84 - Single Family Home Eastern Ballard, Photo



Fig. 85 - Low Rise Apartment Eastern Ballard, Photo



Fig. 86 - Townhome Eastern Ballard, Photo



Fig. 87 - 5-over-2 Eastern Ballard, Photo



Fig. 88 - Ballard Market Eastern Ballard, Photo



Fig. 89 - Apartment Eastern Ballard, Photo



Fig. 90 - Single Family Carport Eastern Ballard, Photo



Fig. 91 - Existing Alley Eastern Ballard, Photo

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