

# EVOLVING THE SUBURBS

John O'Hara

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in  
partial fulfillment of the requirements for the degree of

---

Masters of Architecture

In

Architecture

Susan Piedmont-Palladino

David Lever

Paul Emmons

05.02.2018

Alexandria, Virginia

Keywords: Home, Neighborhood, Residential, Community



The single family home is a building type synonymous with residential architecture among many in the United States. The notion that the ideal built character of a dwelling is a private structure, built on private land, and owned by a private entity is as old as that ownership equating to power in human history. Though the houses of today are no longer the literal manifestations of strength seen in the fortifications of feudal castles or wealth seen in the opulence of imperial palaces, the metaphorical implications remain.

It was on these allegories that the Post-WWII housing boom capitalized, using slogans and advertisements meant to invoke the glory and strength of owning a home. They charged that a man was not truly a man until he owned his own home, and that this American Dream can be achieved for surprisingly low prices. Thus the home was commoditized and development after development of 'single family homes' were replicated across the country.

70 years later, these structures which were built quickly for cost efficiency, and with a very specific 'single family' in mind for their residents are reaching the end of their usable lives. The architecture which replaces or adds to them has significant power to redefine the notion of a single-family home and its surrounding neighborhood. This thesis seeks to understand the current trend of redevelopment in these areas and propose alternate solutions which enrich the built character of the community and expands on the notion of what residential architecture can be.



GENERAL  
AUDIENCE  
ABSTRACT

To address the idea of what the architecture of a home can be, the first step is looking at what that definition is currently and then imagining what it has the potential to become. Through this study the home is revealed as more than the brick and mortar building, becoming instead an extension of the people who inhabit it and their surrounding neighborhood. When viewed through this perspective, the potential impact that building can have and the value it can serve to a community is dramatically increased and should therefore be a topic of significant consideration as new forms of housing are designed. Ultimately this approach will provide a wider set of dwelling options for a broader range of inhabitants within a single connected area.

For Stephanie  
who none of this would have been possible without

And Archer  
for being unwaveringly loyal and generally a good boy

And for Susan, David and Paul  
for their wonderful insight and contributions to this research

# Contents

---

1. Mapping the Issues	pg	1
2. Defining the Neighborhoods	pg	10
3. A New Suburban Form	pg	19
4. Defining the Program	pg	34
5. Old Turned New	pg	40
6. New Beginnings	pg	49
7. Family Business	pg	60
8. Bibliography / Image Credits	pg	69

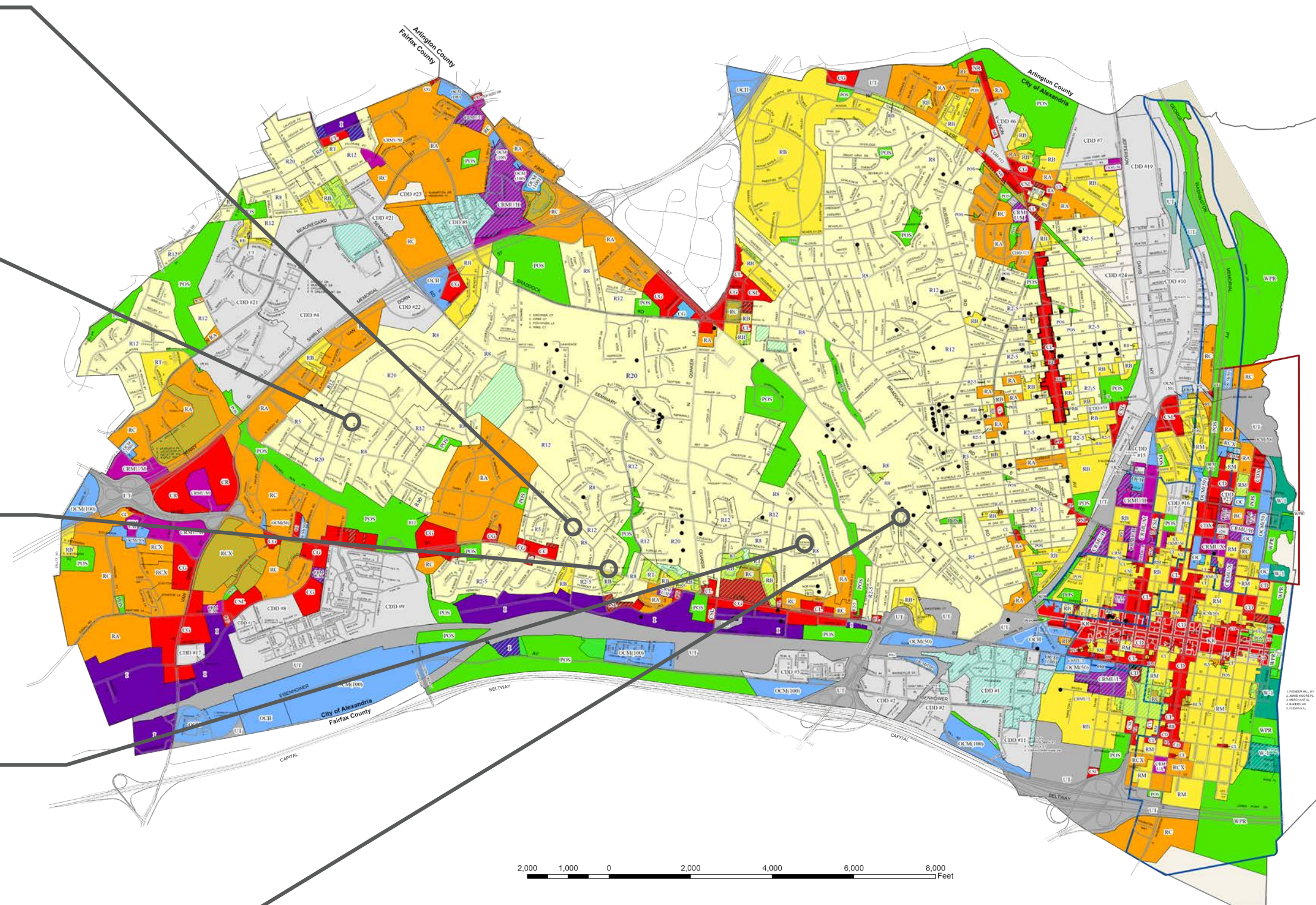
# 1 - Mapping the Issues

It is little surprise that when a home built for the needs of a four-person family half a century ago lapses in ownership, the opportunity for substantial upgrades by the new owner becomes enticing. New residents, seeking to establish a place for long term habitation, often take this opportunity to renovate or add to the existing structure. In many cases however, the necessary upfront work dissuades the type of buyer who is actually looking to live there and instead attracts the kind looking to recycle it for a profit.

Whether by enterprising developers or amateur builders, properties are purchased with the intent to demolish a large part or the entirety of the structure, then construct to the limits of what area zoning code allows. The resulting homes tend to be both double the cost and size of their neighbors and are designed based on metrics of marketable features rather than a consideration of a specific inhabitant. Despite the increase in size, they are built with the needs and desires of the same nuclear family of their predecessors in mind. The resulting impact is higher cost, less efficient housing geared toward a very narrow demographic of residents in some of the most desirable communities to live in.

Alexandria, Virginia is no exception to this practice. These images show either side by side or across the street adjacencies from areas zoned as Alexandria's lowest residential densities. The large homes which replaced structures similar to their neighbors are all less than 20 years old, some still under construction when these photos were taken. Since the attraction of buying a \$400,000 property to re-sell it for upwards of \$1,000,000 just months later is hard to ignore, it is first important to understand the nature of the single family housing market in the area if alternatives are to be presented.





Alexandria VA 2016 Zoning Map  
<https://www.alexandriava.gov/uploadedFiles/gis/info/ZoningMap2016.pdf>

## ZONING LEGEND

### RESIDENTIAL

- Low** - Single Family Detached or Duplex
- Med** - Townhomes
- High** - Apartments or Condos

### MIXED USE

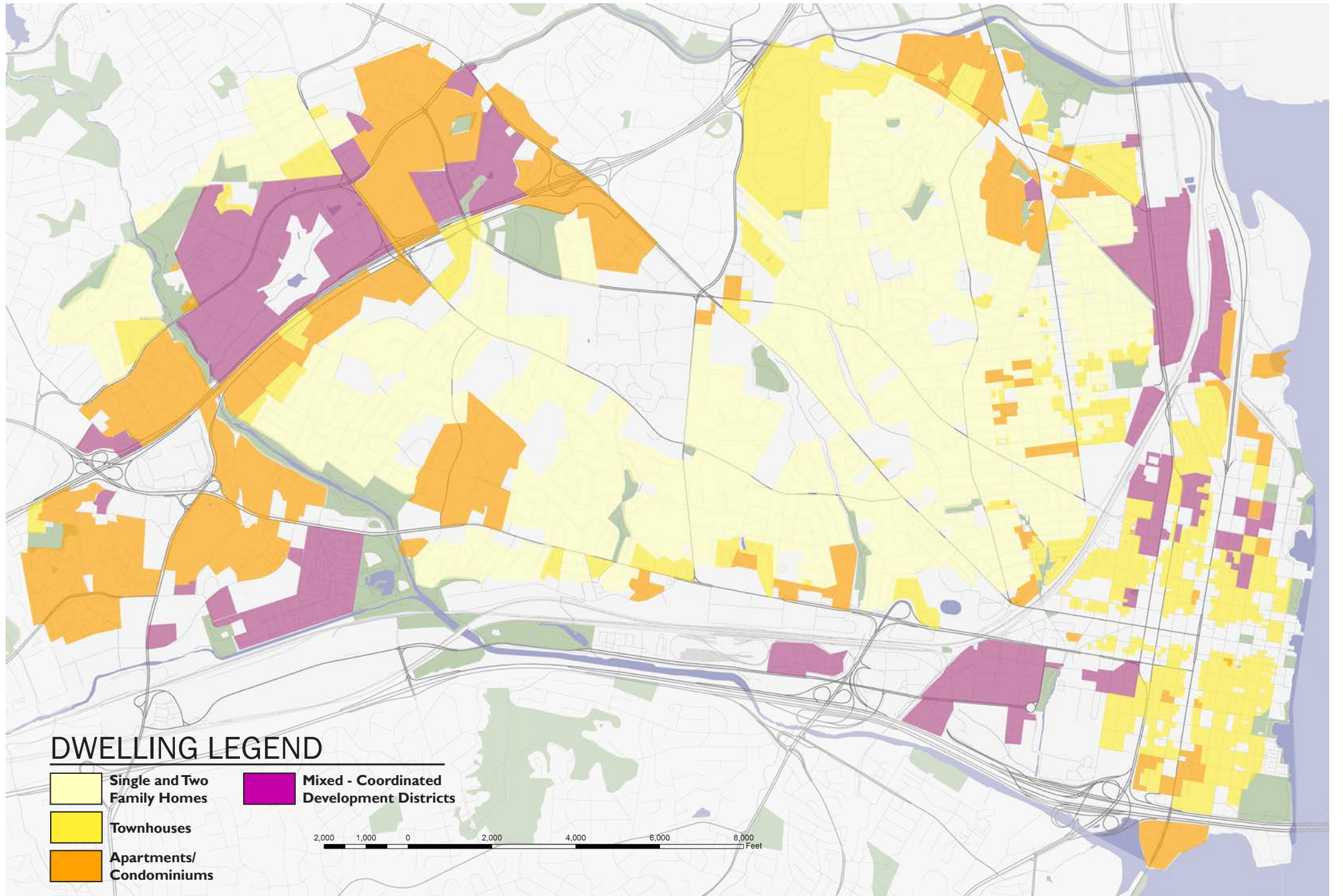
- Existing** - Commercial Residential Mix
- Development Districts** - Focused Mixed Use
- Waterfront** - Potomac Mixed Use

### BUSINESS

- Retail** - Restaurants, grocery, stores
- Office** - Commercial/professional Businesses

### INFRASTRUCTURE

- Transportation** - Highway and Rail
- Industrial** - Shipping and Manufacturing
- Parks** - Public Access Open space





## NUMBER OF ALL HOUSING UNITS

---

**74,317**

## NUMBER OF SINGLE DETACHED UNITS

---

**10,847 (14%)**

## TOTAL AREA OF ALEXANDRIA

---

**15.5 sq mi**

## AREA OF SINGLE DETACHED UNITS

---

**2.9 sq mi (19%)**

## AREA OF ALL OTHER HOUSING TYPES

---

**4.9 sq mi (32%)**

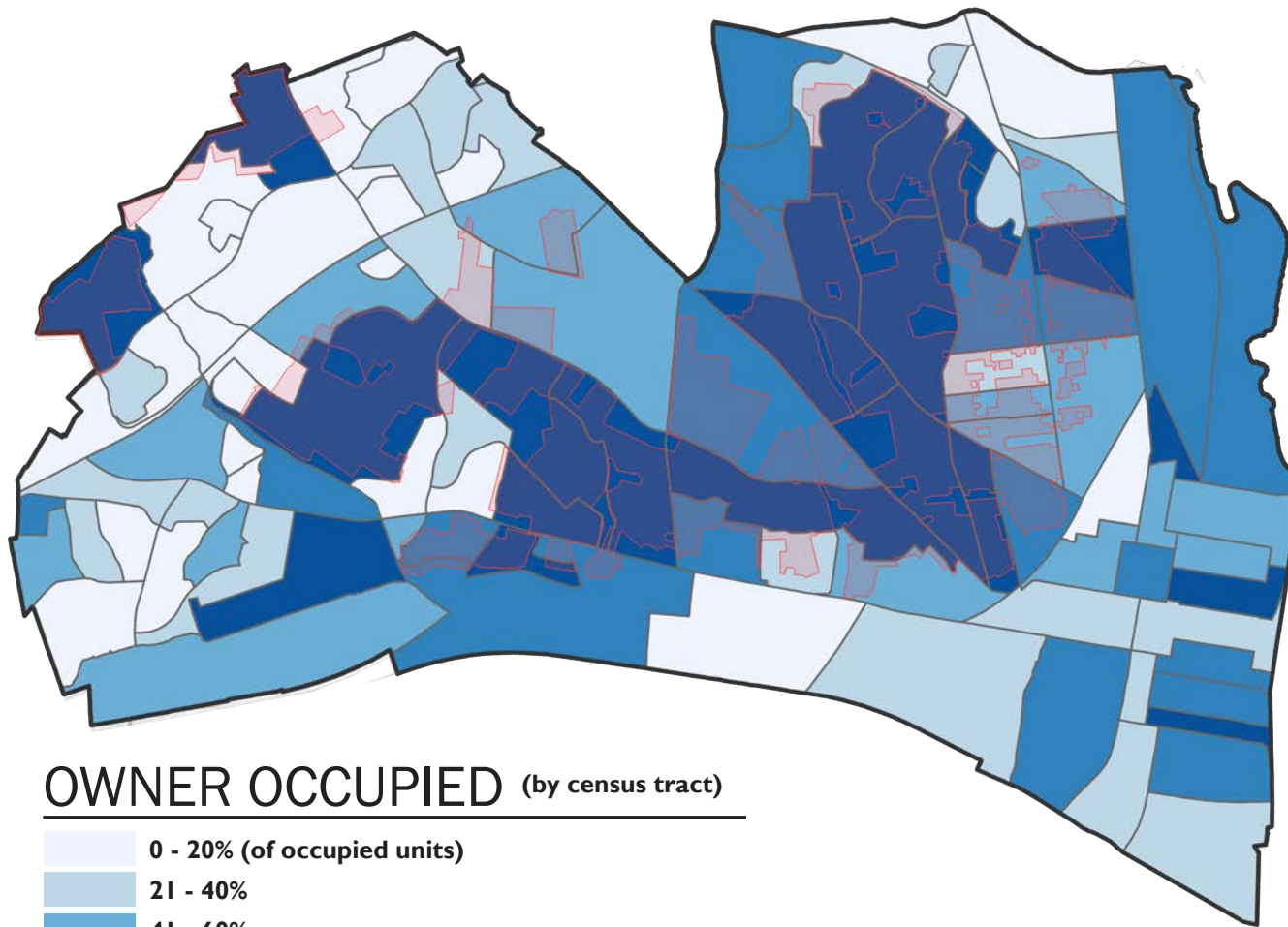
Most striking among the neighborhoods at the focus of this study is the extensive amount of physical space which they occupy. To illustrate that quantity, the map to the left filters out all other uses but residential from the zoning plan. Of that area shown, 20% of the City's land is being dedicated to what is already the lowest density of inhabitable dwelling types.

The remaining periphery which accounts for 86% of the available housing units in the city, occupies only 32% of the city's area. In other terms, only 13% more space than the low density residential is needed to house the remaining 86% of residents.

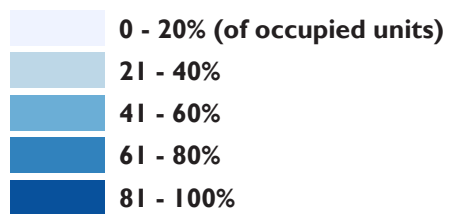
Based on an average family size of 3 people per household, the ratio of built to unbuilt space in the single and two family zone is 618 sf per person for built structures and 2,947 sf per person for unbuilt/open land area. If, however, the development pattern mentioned previously were to continue to all existing homes, that built area average would double to 1,275 sf per person. The resulting condition would mean a 42% built to unbuilt ratio without a significant increase to overall population.

The need for housing is always present in a city, thus allowing that level of excess and the environmental and social consequences that accompany it should be discouraged. The issue with that kind of prevention is inherent in the nature of the spaces however. With private land having few existing regulations preventing these types of developments, and construction trends steering new projects towards expansive structures, enacting restrictions will be a significant challenge.

Instead, for any type of shift to occur in the opposite direction it must respond in a way that acknowledges the factors of the existing market and the inhabitants who ultimately have the power to decide where it goes next.

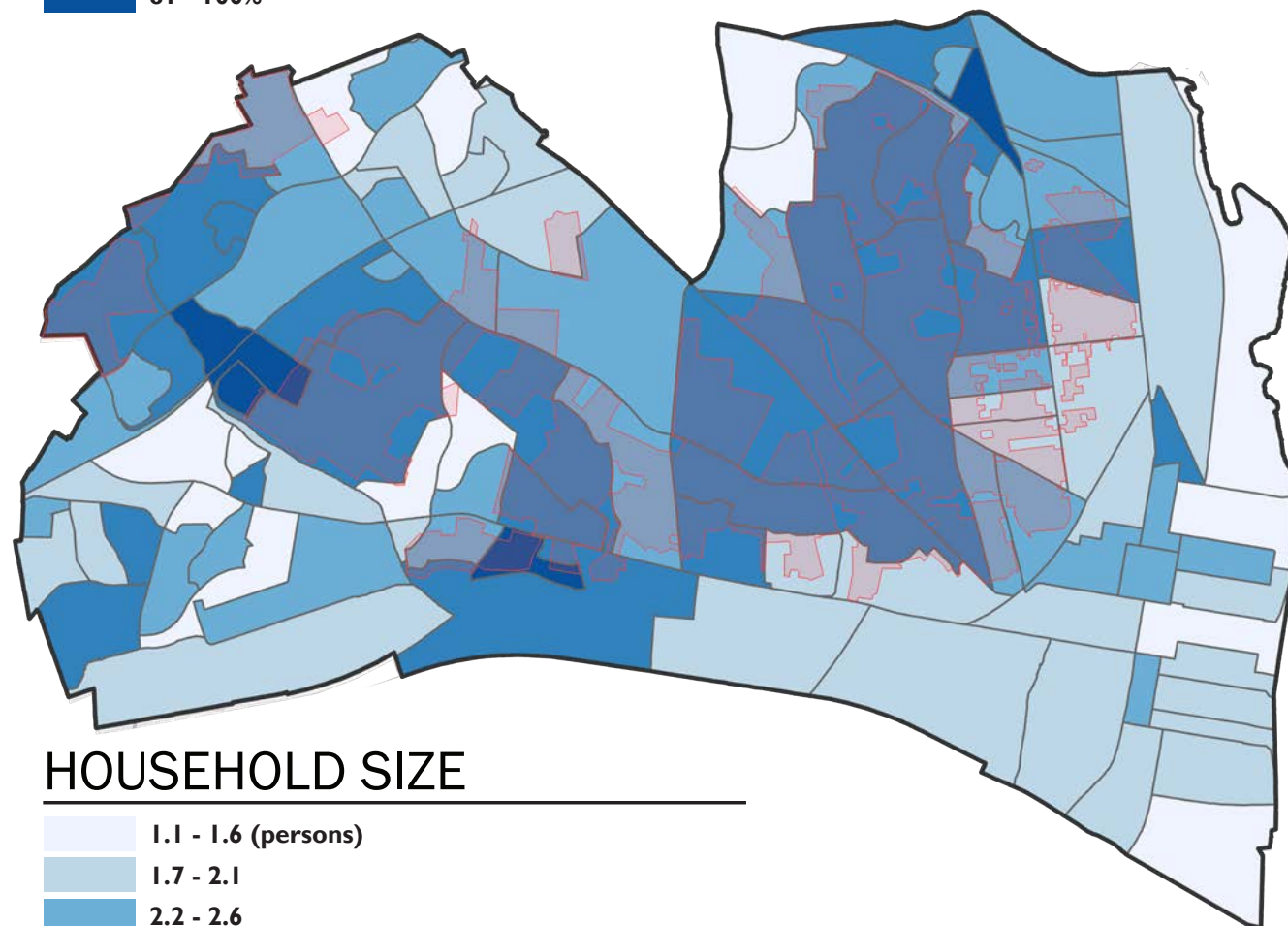


## OWNER OCCUPIED (by census tract)

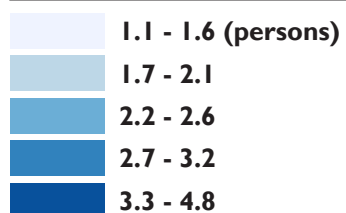


The face of that market is, for the most part, much as would be expected for single-family neighborhoods. Using census maps overlaid with the areas of single and two family zoning in red, trends in demographics become clear.

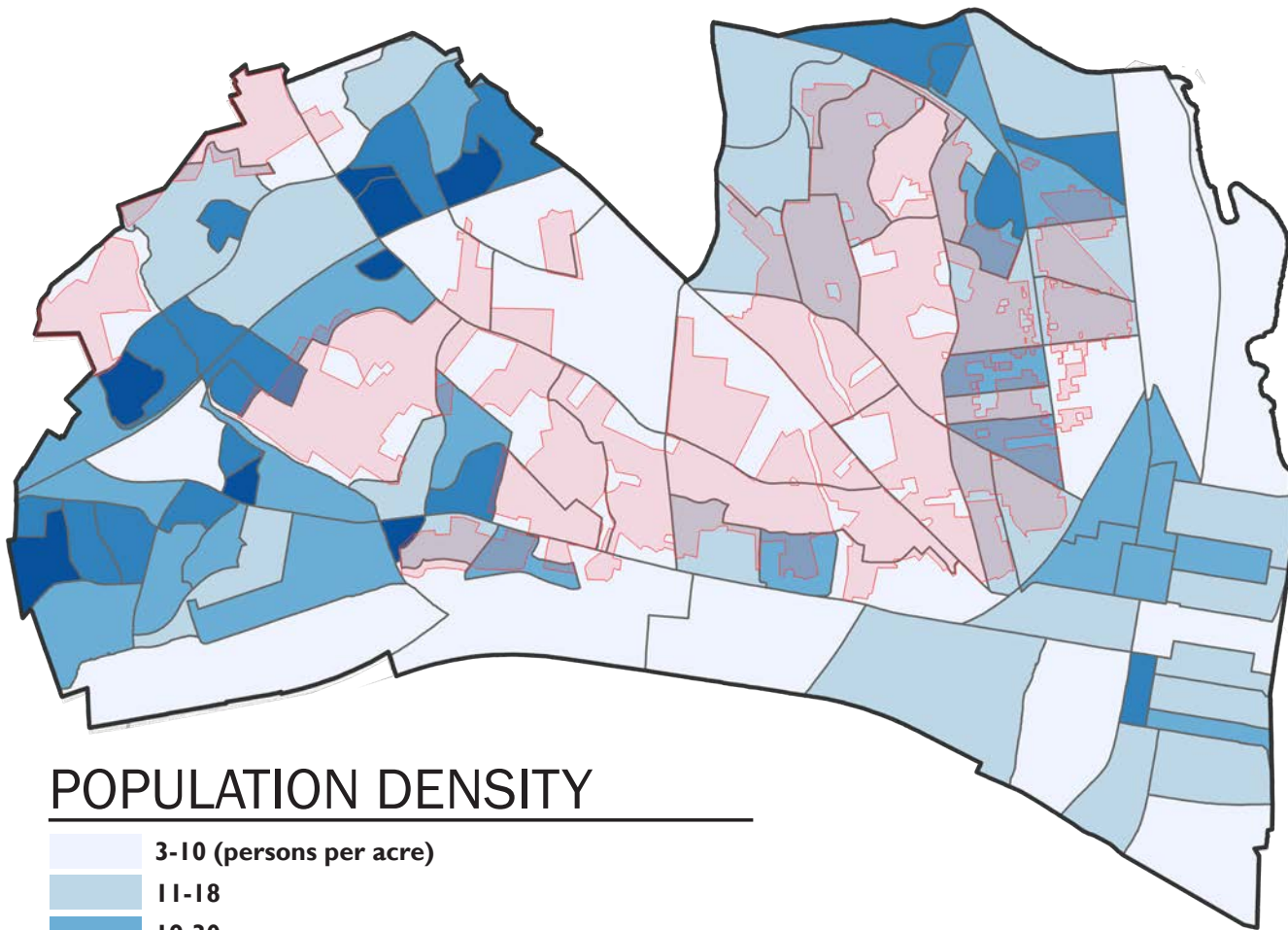
These areas have the highest percentage of owner occupied housing with a few exceptions.



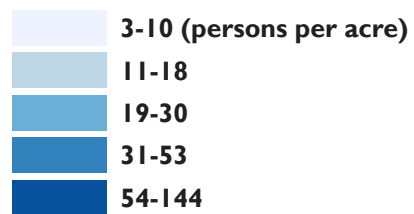
## HOUSEHOLD SIZE



They also fit neatly in to the small family household model of 3 persons to a structure, two parents, one child.



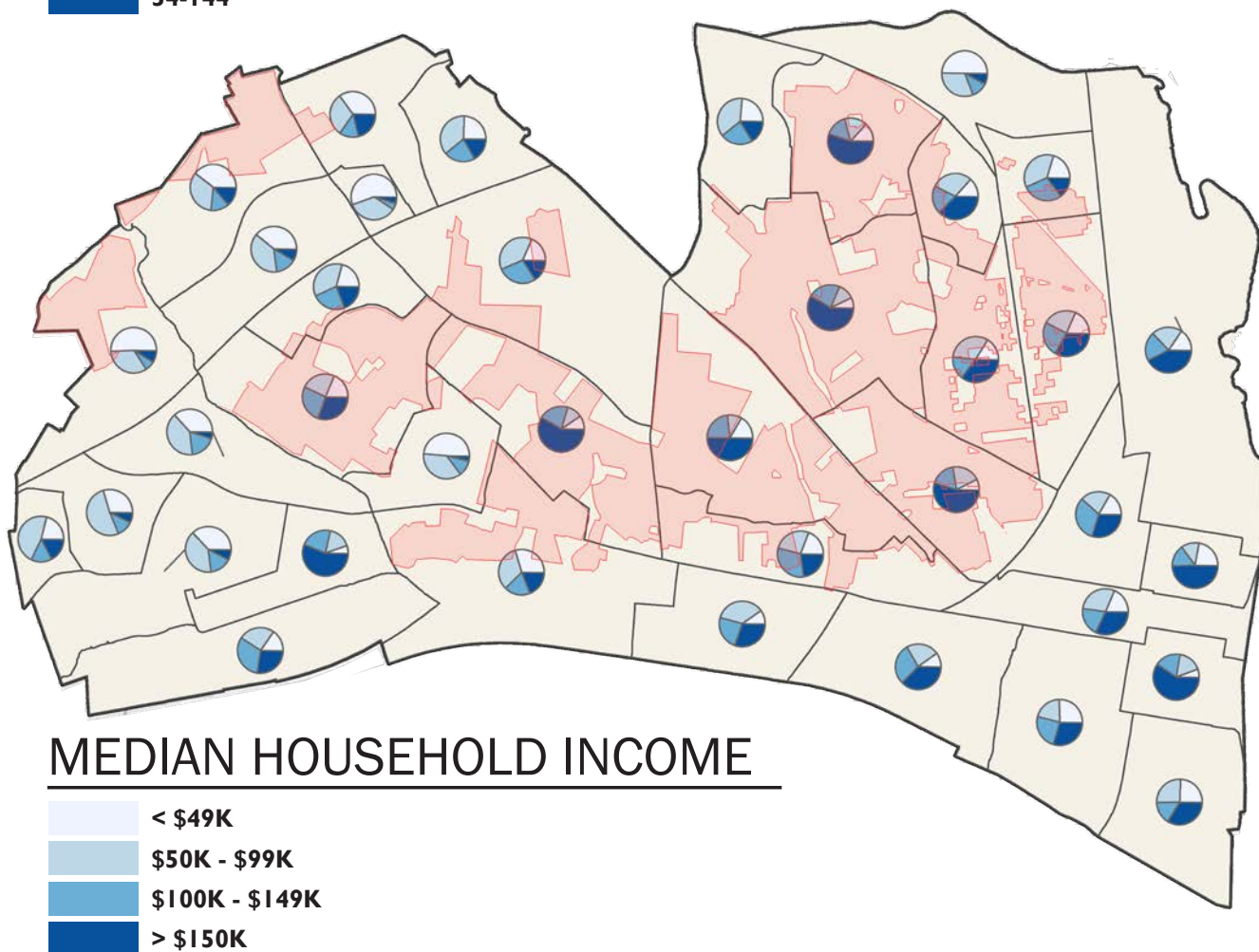
## POPULATION DENSITY



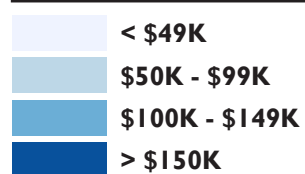
Population density is shown to align with the observations previously stated.

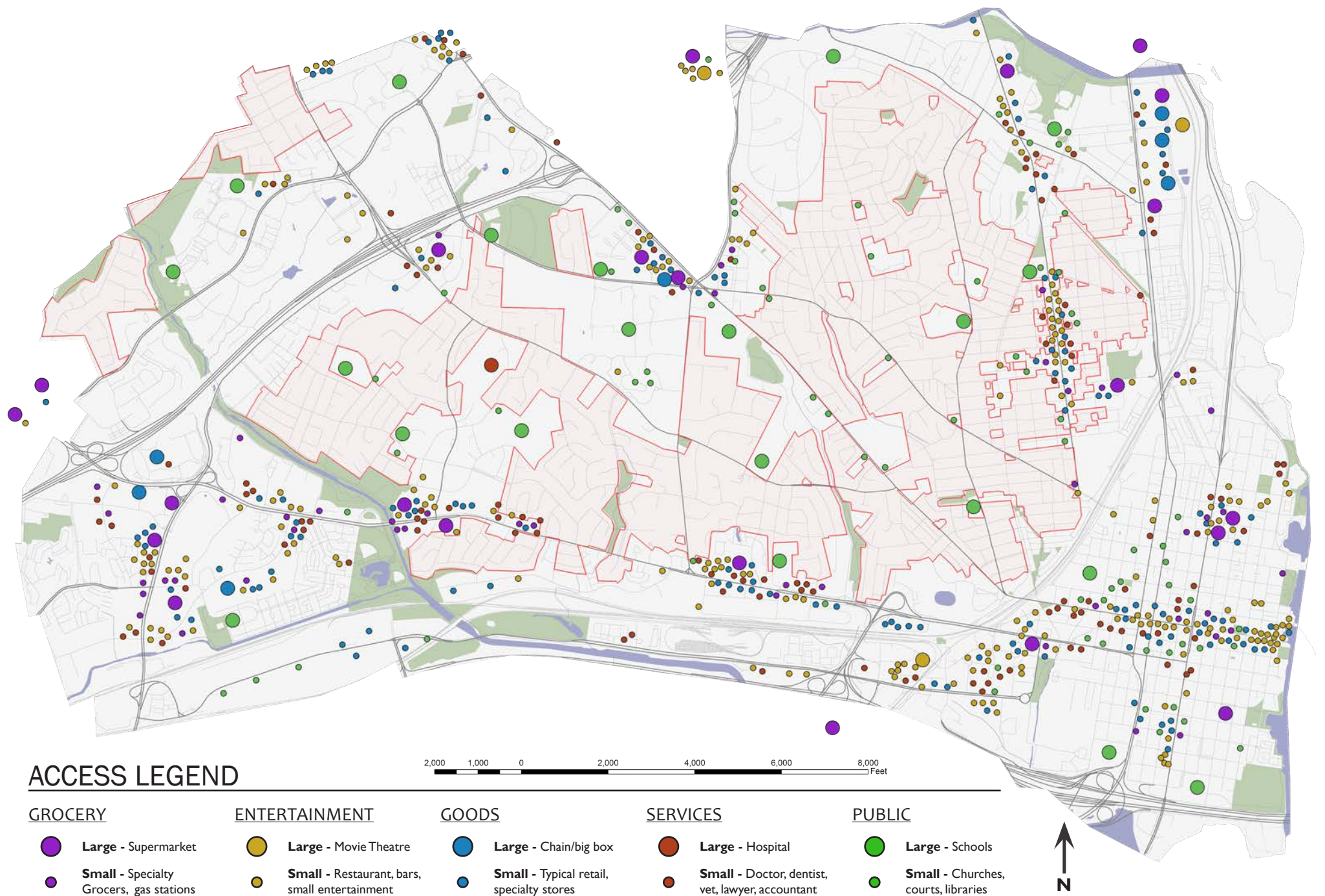
And wealth is disproportionately high in the areas where one is likely to own their home rather than rent.

The demographics show the limited range of living types which these neighborhoods serve. Since few of the units available are rentals, one must have the upfront capital for a down payment which immediately eliminates these neighborhoods as viable for a large swath of the population. Assuming one does have the financial means to own, they would be limited to purchasing a specific housing type: typically consisting of multiple bedrooms and bathrooms, a single kitchen and large yard all set in a location nearly fully reliant on cars to get from place to place.



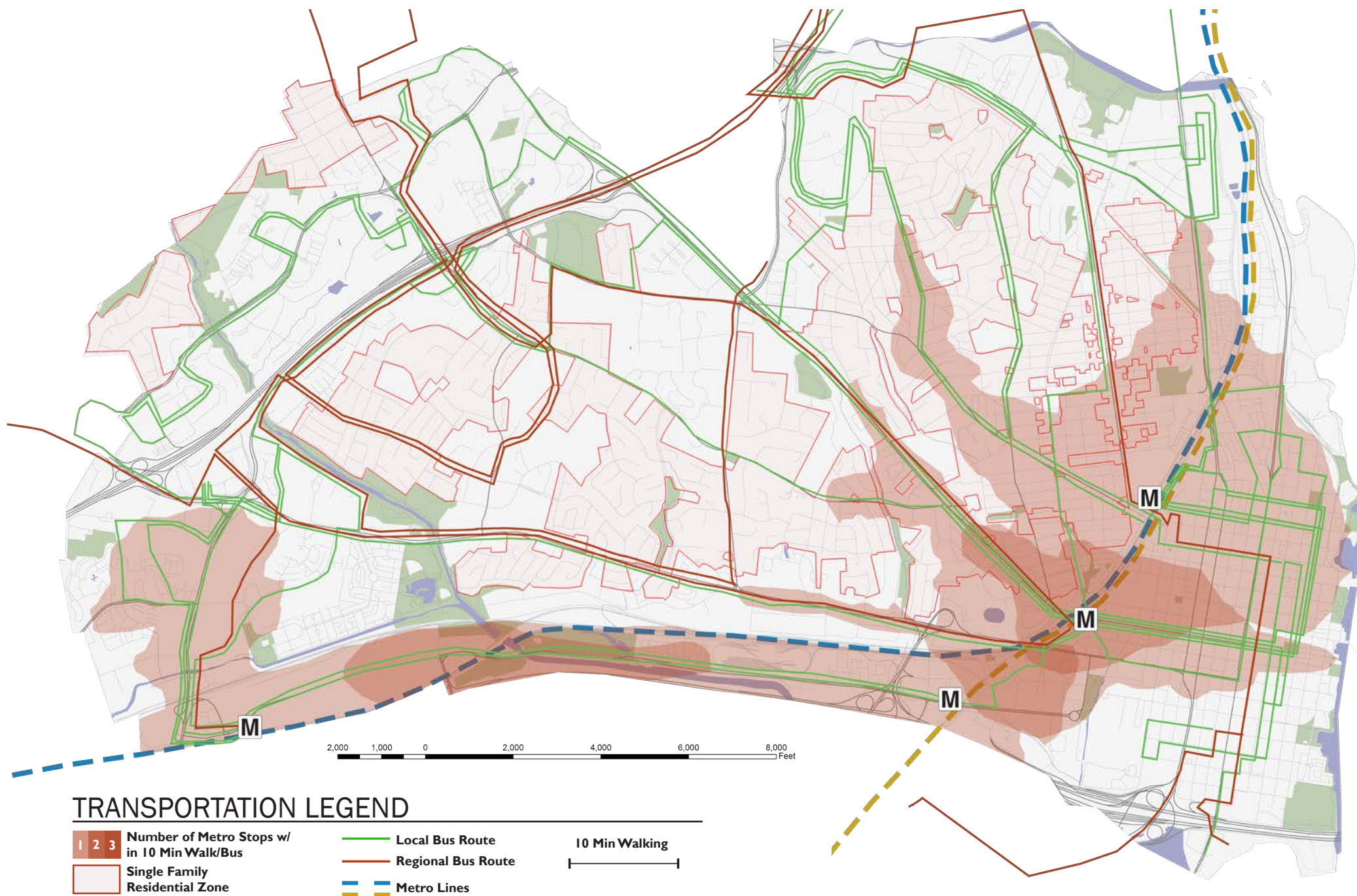
## MEDIAN HOUSEHOLD INCOME



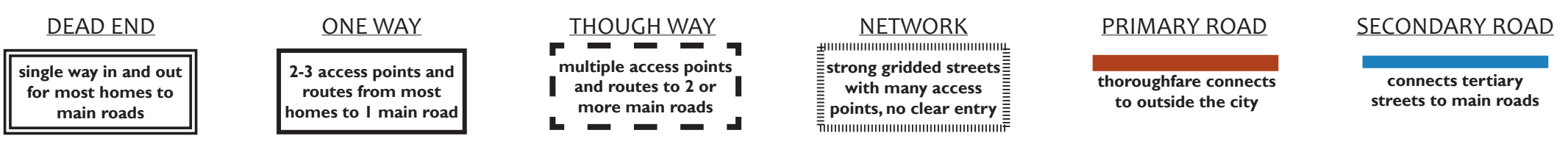
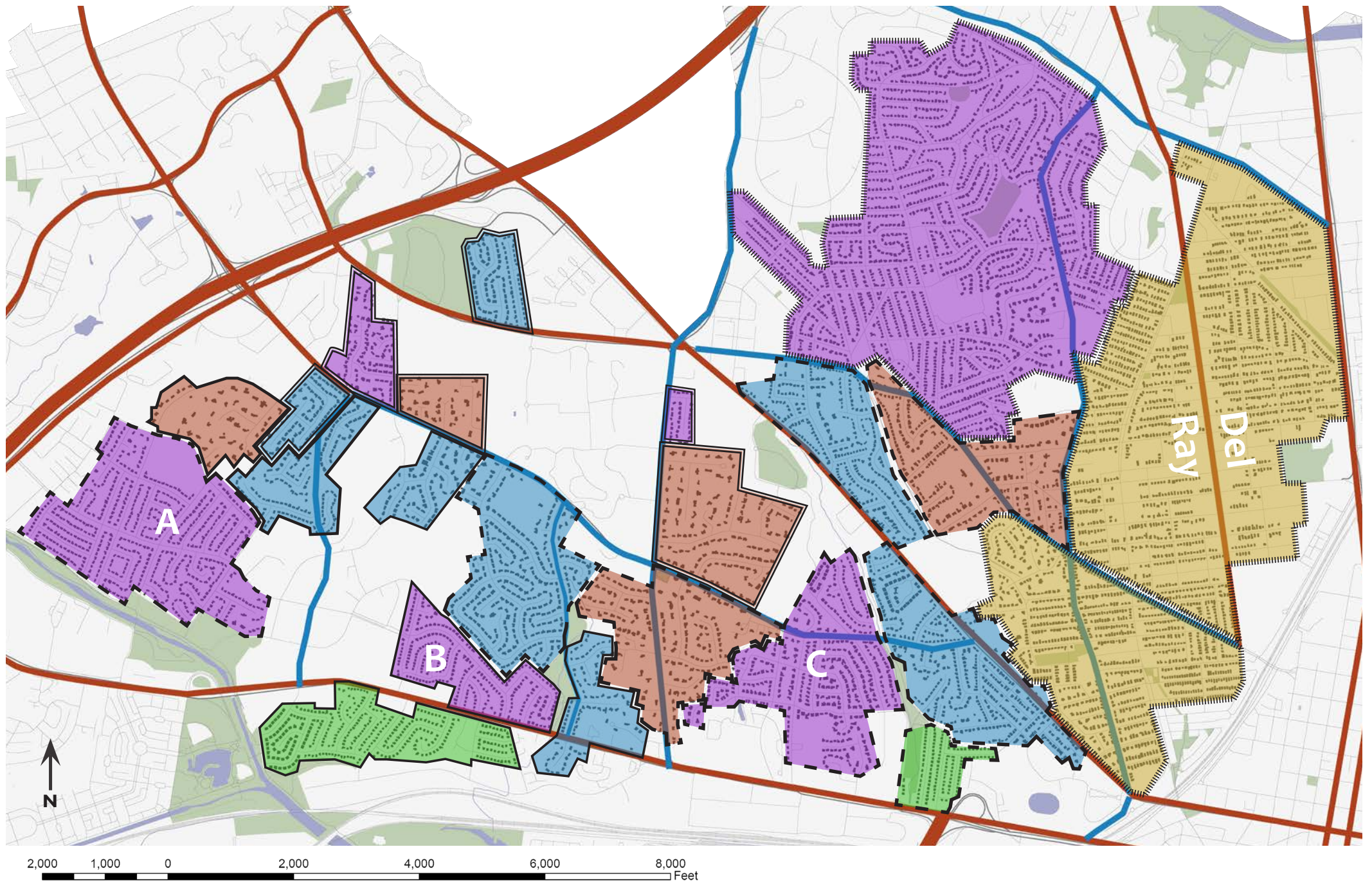


That model makes sense for the Mom, Dad, one or two kids, and a dog family structure who want the space and peace of a quiet residential suburb, and for whom that type of development was originally planned. For most other types of living situations however that attraction is more a deterrent. A single professional, with the monetary means to live in such a place, is more likely to want to live in a smaller apartment close to the city than a house built for four. The reason for this is not only the structure (which is generally alterable to the inhabitants needs) but the location of these structures.

Typically, these neighborhoods are under-served by immediate access to public transportation and other amenities. They were designed around the idea that all the non-residential functions necessary for a community would be accessible via one's private vehicle. The map above highlights this condition in stark detail. Civic functions, such as schools and churches, which are allowable in residential zoned areas by code, are mixed within the low-density neighborhoods. The closest commercial, retail, entertainment, and grocery functions however are all clustered together along main vehicular roadways, separate from the neighborhoods they serve.



Public transport furthers this car dependent isolation, with reasonable 10-minute walking/bus access to the main metro lines seeming to avoid these communities. All these conditions combined further illustrate the challenge of altering the established development pattern. If the areas are privately owned, zoned to promote spatial growth over population growth, and located within areas dependent on cars to function, it is no surprise that new development continues in that trend. To break that cycle and incentivize a more diverse pattern of residential development, changes need to begin not at the level of the home but at the scale of the broader community working inward. That push comes from investing in factors other than housing, providing for more and varied options for the existing residents, and making the area attractive to more than a housing-centric market.



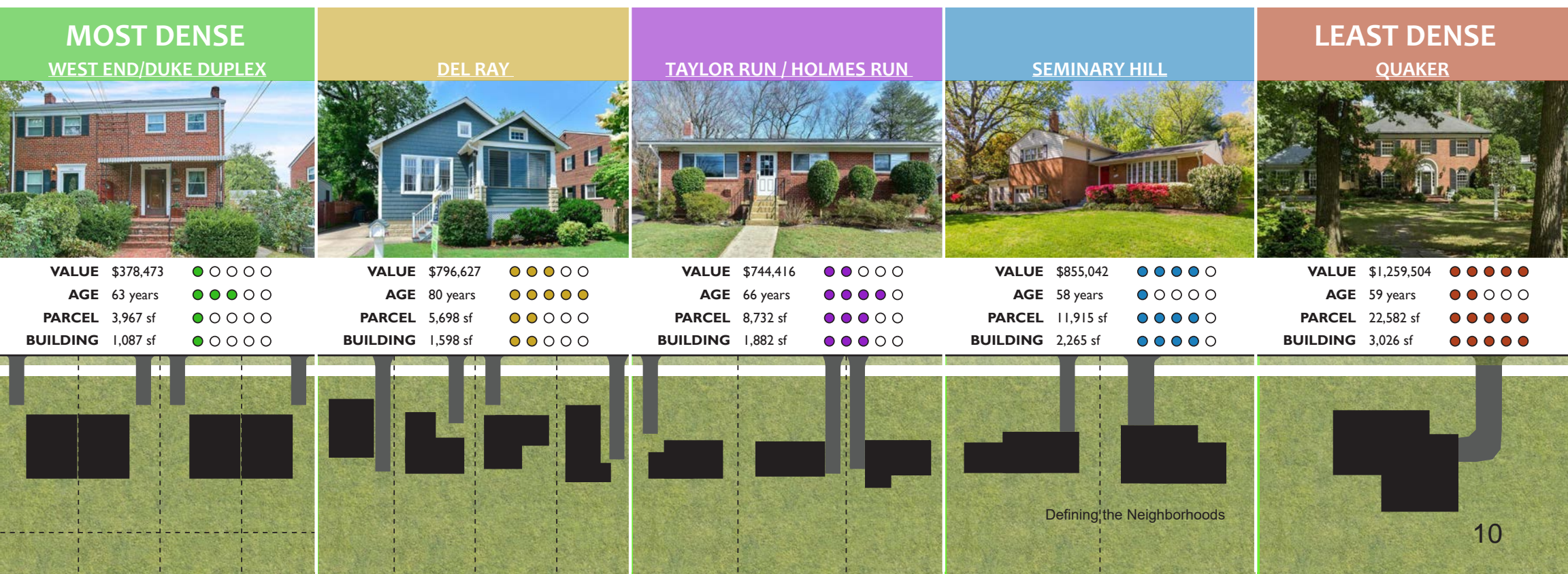
The first step in establishing a method for alternate development via community investment begins with selecting a case study area for which to prove those concepts. To determine that specific location, the previously studied areas of low density residential were analyzed further to define separate and distinct neighborhoods. Factors of house size, lot area/zoning level, value, and age of structure were cross referenced to formal qualities like groupings of repeated architectural styles or in some instances repeated buildings. Where clear consistencies in these qualities were seen, another layer of physical access and location was added to ultimately define unique neighborhoods based on a combination of built qualities and perceptible boundaries.

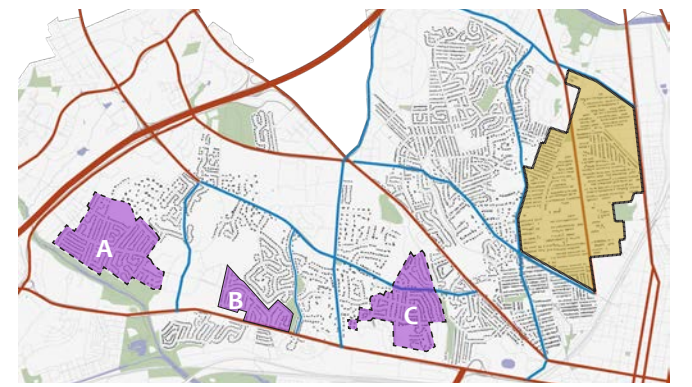
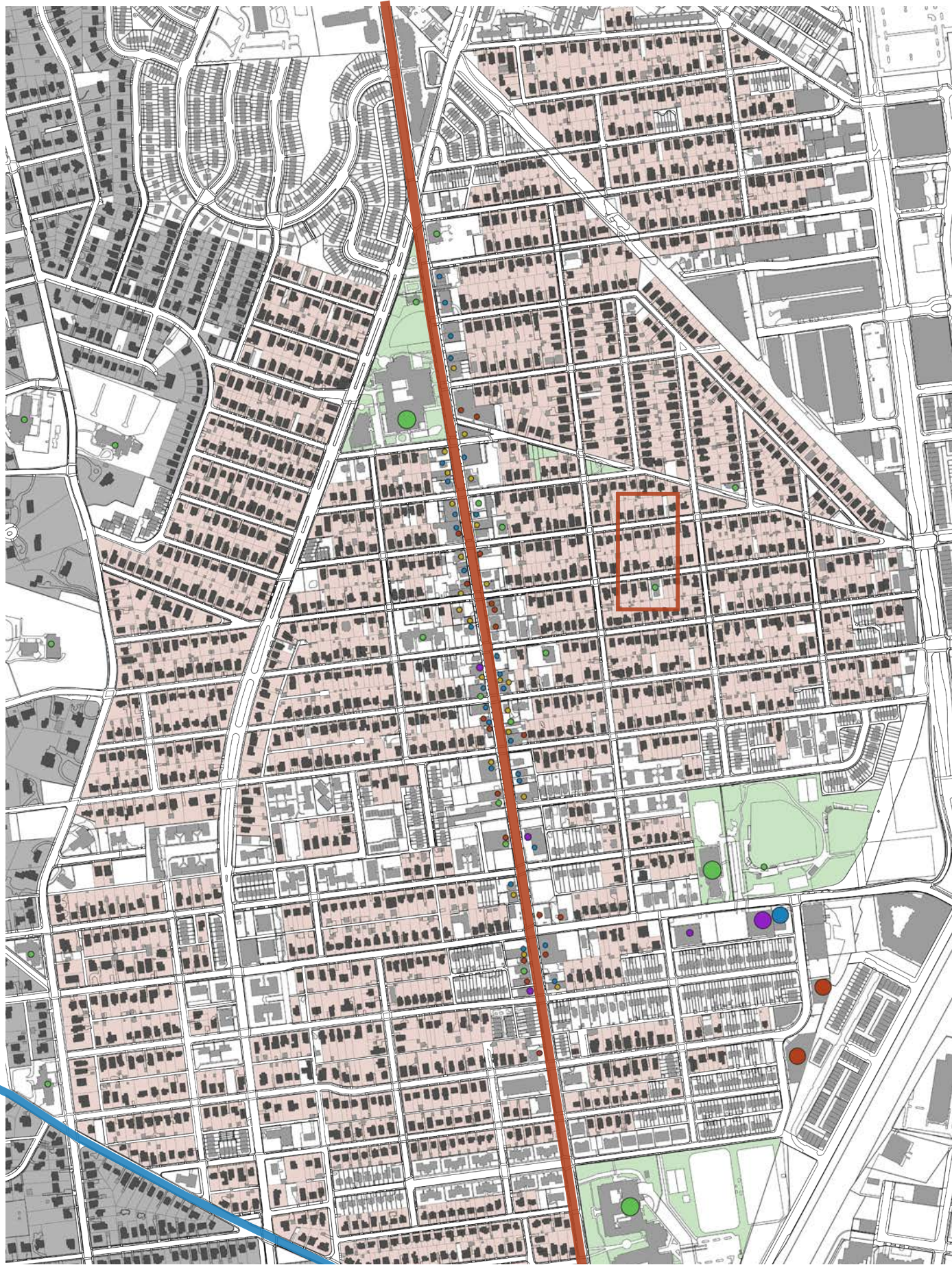
# 2 - Defining the Neighborhoods

The resultant map shows this study's ultimate analysis of the varied low density residential neighborhoods of Alexandria. Colors represent increasing levels of built density while borders represent the physical connectedness to surrounding areas. Though the locations of each neighborhood type vary and are well mixed with one another, one thread remains fairly consistent. As density decreases, property area, building size and land value all go up with the one exception of Del Ray, which has a higher average value than that of the Taylor Run/Holmes Run neighborhoods. Why this is so will be investigated in more detail, but a key reason is its proximity to a broader range of amenities not as available to any of the other areas.

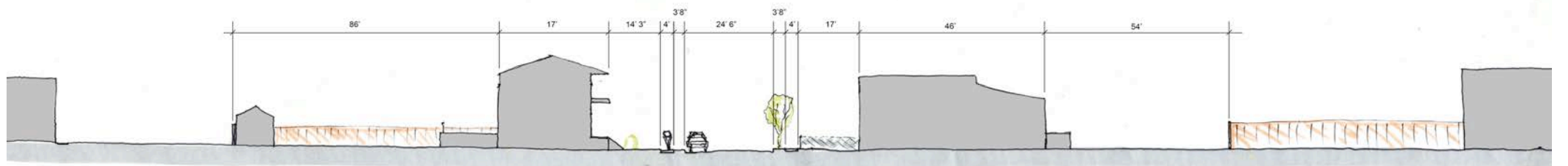
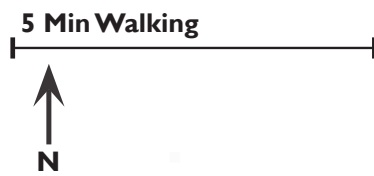
With regards to an applicable case study area however, the Taylor Run/Holmes Run neighborhoods prove the most viable options, specifically those three labeled in the southern most section of the map. The three to the north were eliminated due to scales that were either too small to allow for a cohesive study or too large to get a good level of detail. The higher density areas of the West End/Duke Duplexes and Del Ray were likewise discarded due to the already relatively high levels of density they have. The lower end of the density spectrum were also not considered primarily due to existing land values and generally isolated access patterns being prohibitive to any realistic study of redevelopment.

Since the goal is to establish a method of expanding housing options within existing suburbs, thereby creating density, the three potential neighborhoods selected were compared against that of the next highest density development in the area: Del Ray. Not only does this neighborhood have a level of density conducive to a mixed type housing market, it is also an active and vibrant community with a successful commercial 'main street' and a variety of housing types and residents. If other neighborhoods are to emulate those factors which make Del Ray successful, using it as a base line for comparison is a good place to begin.





As mentioned, what makes Del Ray successful in the terms of community is its built diversity. Mixed in among the primarily single-family detached homes are a variety of dwelling types and uses. Garden style apartments sit across from 2-family semi-detached units which are next to single-family structures which have been converted to multi-level duplexes. These many uses feed off a busy main corridor lined with local shops, businesses, restaurants, and bars. The proximity of the homes to all of these offerings is the reason for the higher average property value despite their much smaller relative size. Because of this, new homes in this area tend to respect that established scale. To repeat that practice elsewhere in the city, a comparative analysis of the 3 other potentials and their merits needs to be performed.







# DEL RAY - PRECEDENT

## 16% Built Housing

**Residential Structures**

**2,009 total buildings**  
**566 of which are Duplex**  
**2,575 total homes**  
**~1,726,932 sf built area**

**Parcels**

**10,675,800 sf owned land**

**VALUE** \$796,627 ●●●○○

**AGE** 80 years ●●●●●

**PARCEL** 5,698 sf ●●○○○

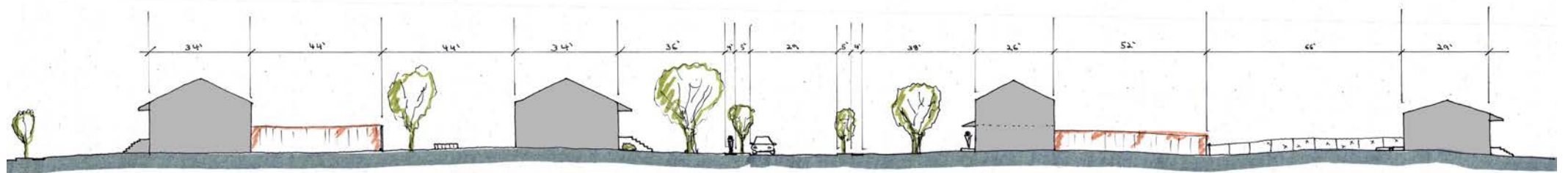
**BUILDING** 1,598 sf ●●○○○



5 Min Walking



GROCERY    ENTERTAINMENT    GOODS    SERVICES    PUBLIC



**NEIGHBORHOOD - A** 12% Built Housing

**Residential Structures**  
 610 total buildings 24 of which are Duplex  
 (634 total homes ~623,000 sf built area)

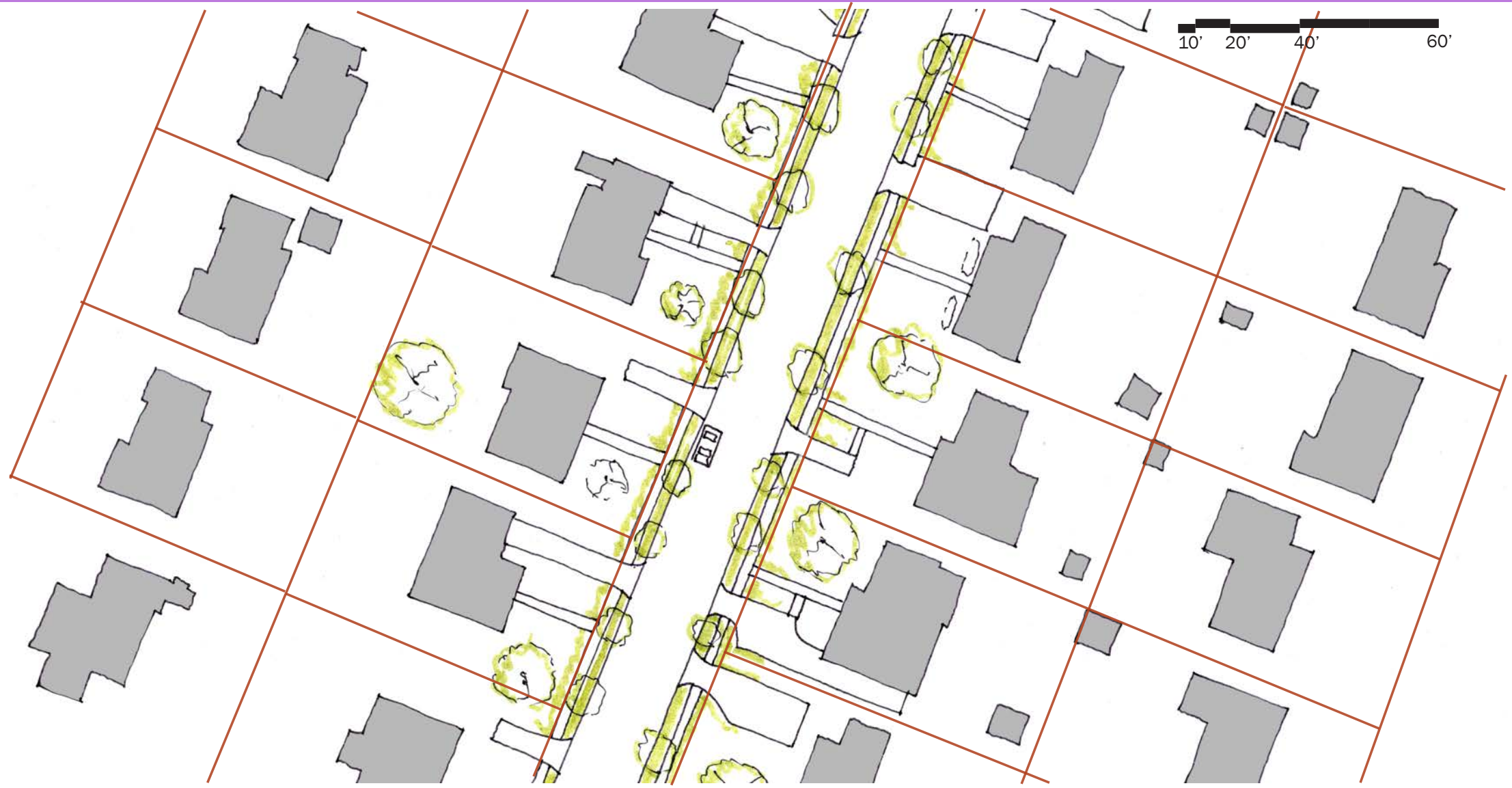
**Parcels (5,340,642 sf owned residential land)**

**VALUE** \$512,473 ● ○ ○

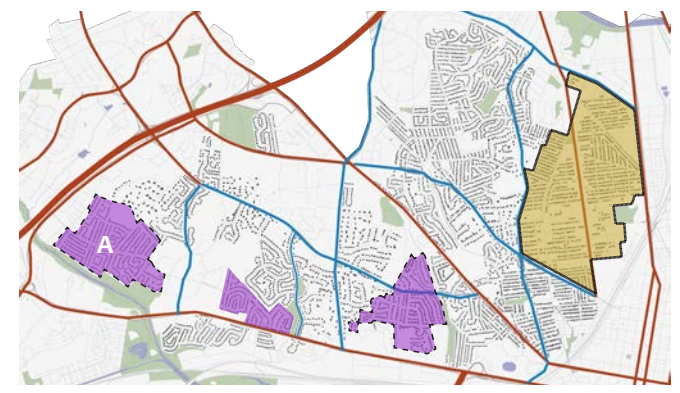
**AGE** 60 years ● ○ ○

**PARCEL** 9,021 sf ● ● ○

**BUILDING** 1,645 sf ● ● ○



The first area looked at on the far west end of Alexandria has the most regular street pattern and level site conditions. The buildings are the youngest of the 3 comparisons but only by a year on average. In terms of amenities, this area is the furthest removed from commercial access and public transportation but is well served with civic functions of churches, schools, a recreation facility, senior center, library and public park system all within walking distance.

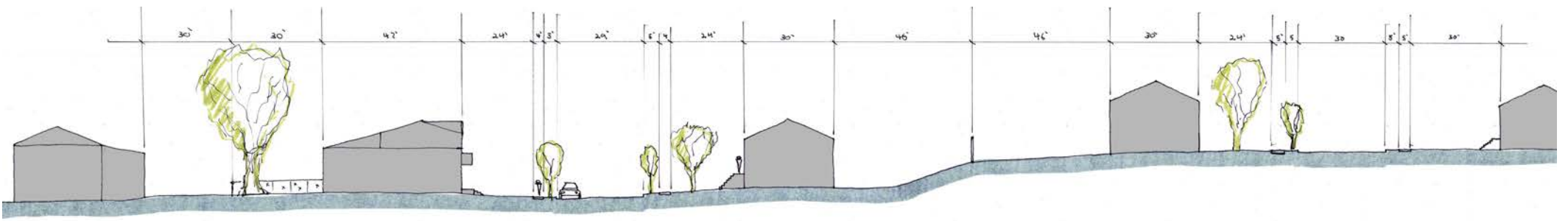




**5 Min Walking**



GROCERY    ENTERTAINMENT    GOODS    SERVICES    PUBLIC

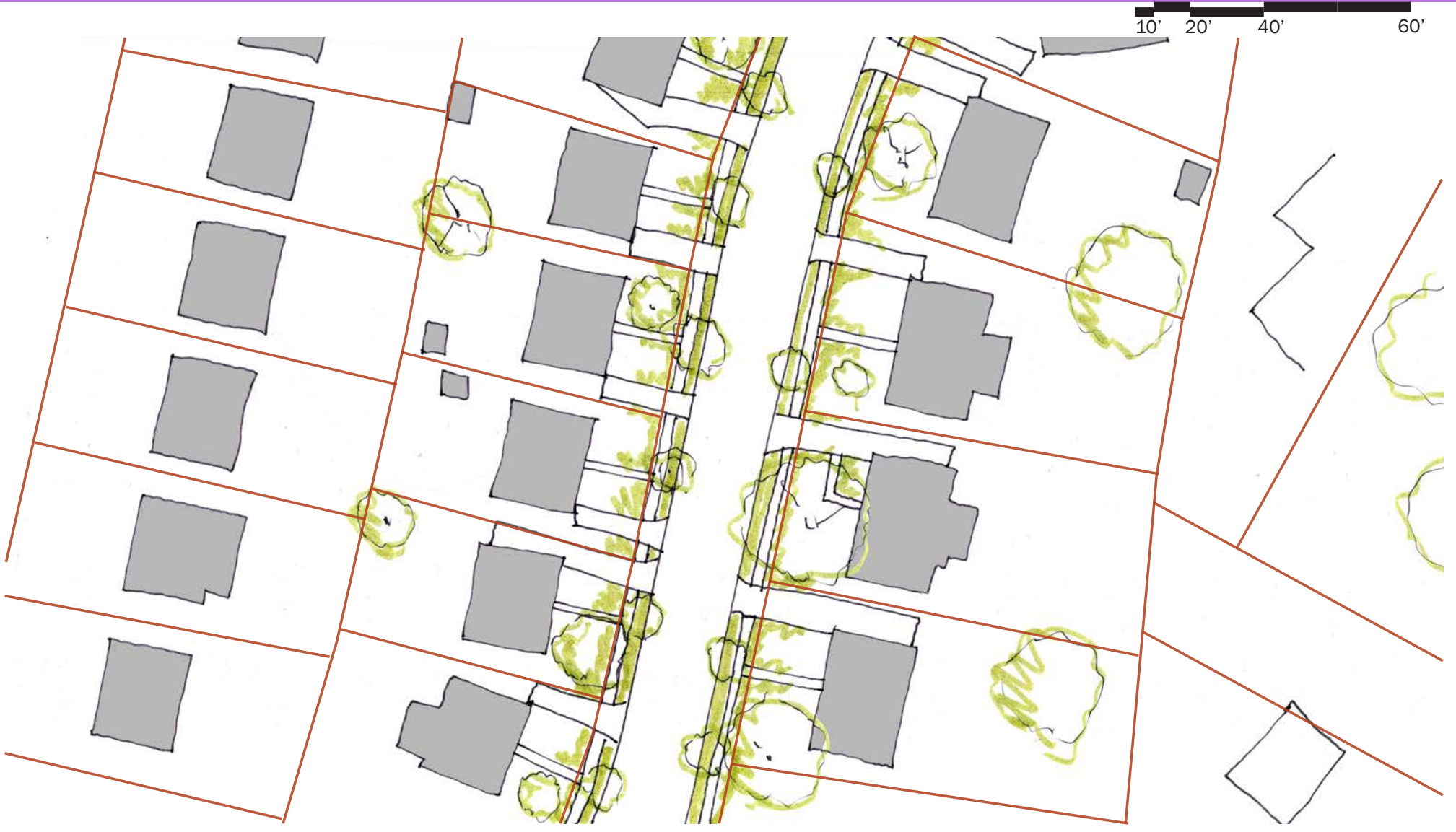


# NEIGHBORHOOD - B 12% Built Housing

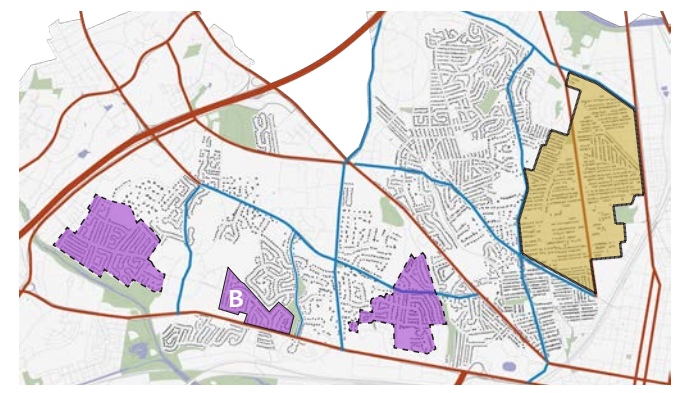
**Residential Structures (no Duplexes)**  
 (253 total homes ~258,000 sf built area)

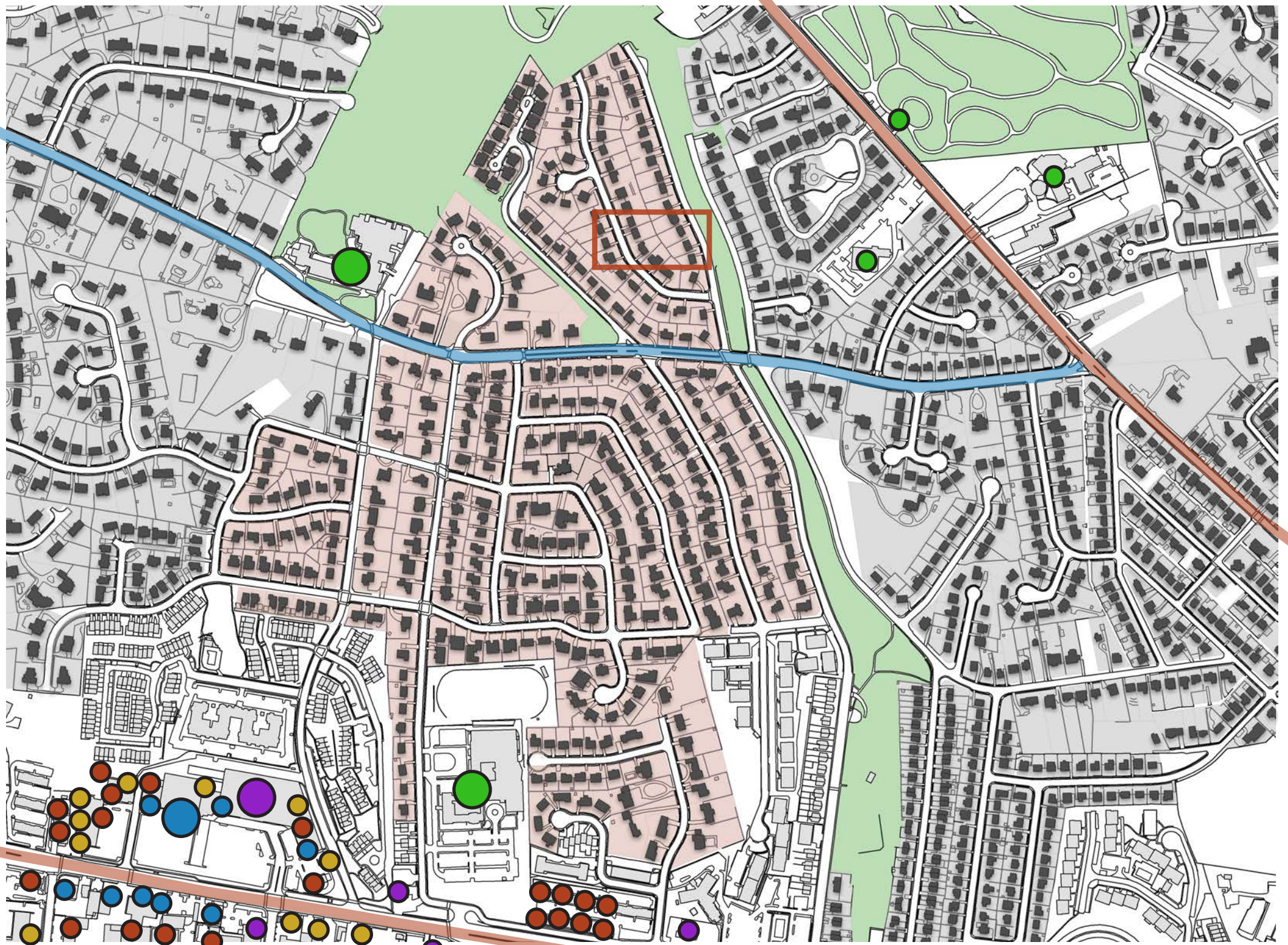
**Parcels (2,188,313 sf owned residential land)**

<b>VALUE</b>	\$520,945	● ● ○
<b>AGE</b>	62 years	● ● ●
<b>PARCEL</b>	8,227 sf	● ○ ○
<b>BUILDING</b>	1,274 sf	● ○ ○



Neighborhood B has the most immediate access to a main public transportation line, with a handful of retail amenities within walking distance. The property value is slightly higher than that of Neighborhood A, though the building and lot sizes are the smallest of the three. Since all streets connect back to Duke, a main corridor, for access in and out of the neighborhood, there are no existing and very few future opportunities for redundancy in access.

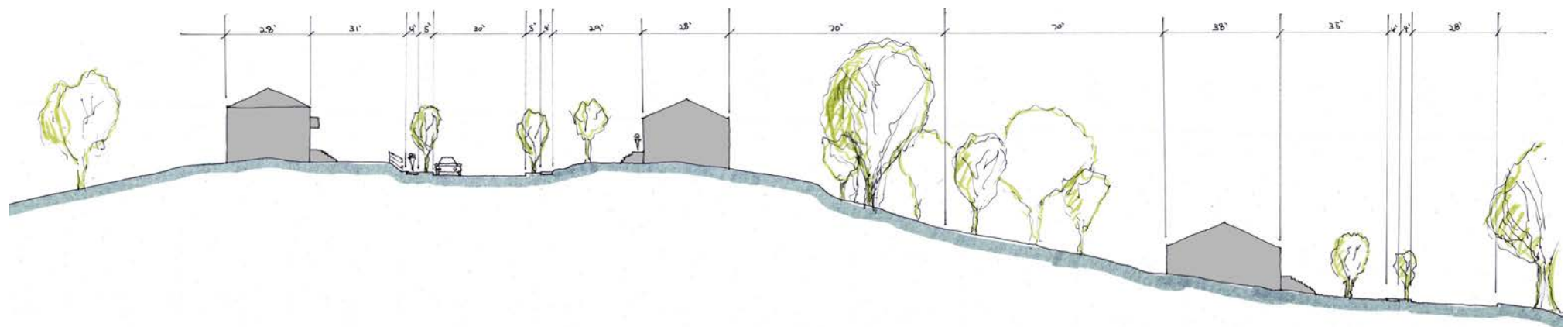


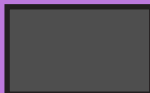


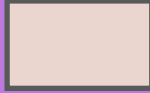
5 Min Walking



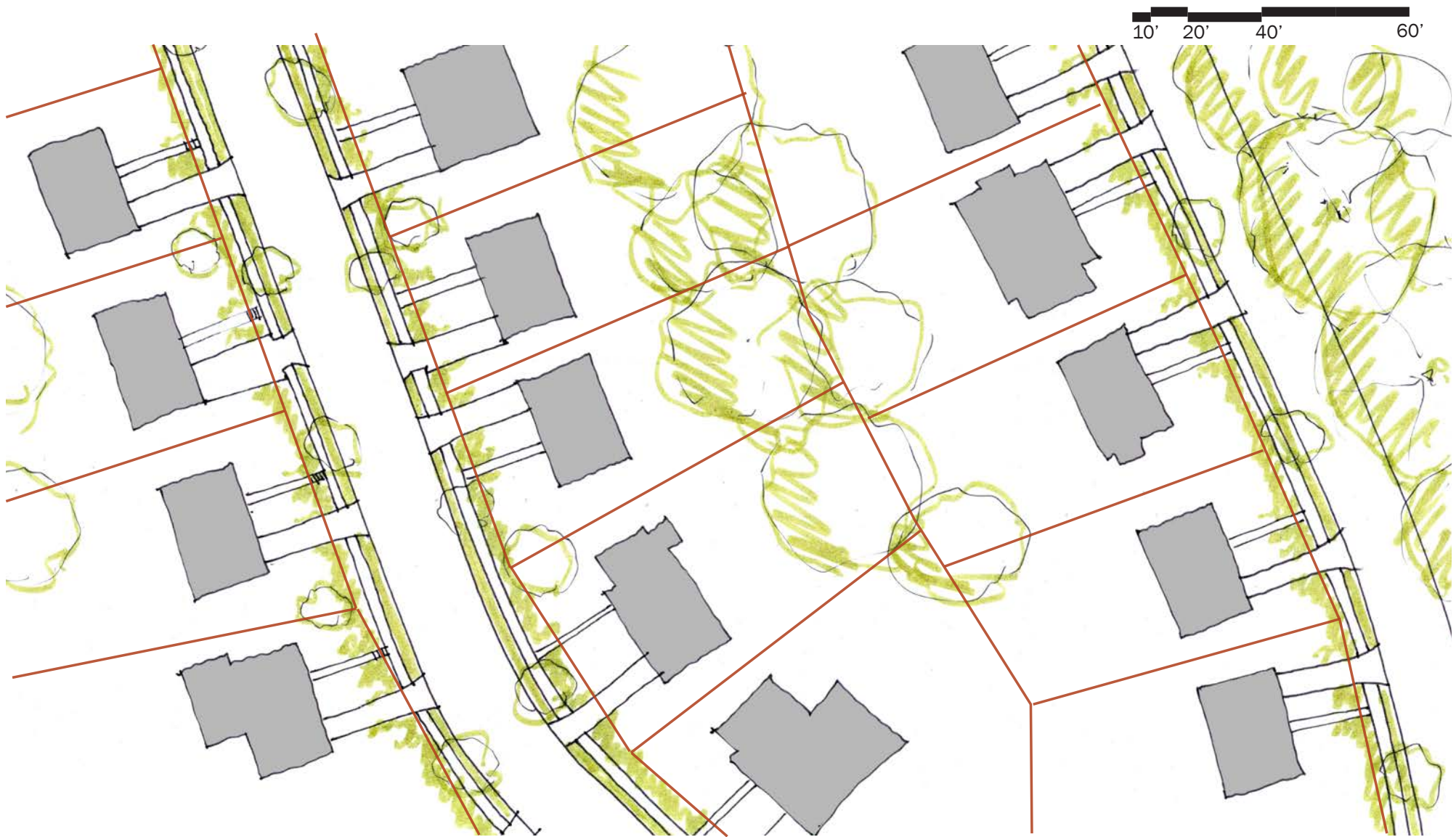
GROCERY ENTERTAINMENT GOODS SERVICES PUBLIC



 Residential Structures (no Duplexes)  
(362 total homes ~521,000 sf built area)

 Parcels (3,785,265 sf owned residential land)

<b>VALUE</b>	\$795,975	● ● ●
<b>AGE</b>	61 years	● ● ○
<b>PARCEL</b>	10,485 sf	● ● ●
<b>BUILDING</b>	2,022 sf	● ● ●



The final neighborhood studied is the best served by a balance of walkable amenities and is situated with multiple means of vehicular and public transportation access. However the delta in average cost of this area when compared to the previous two limits its viability. Despite it having the most regular street grid in terms of redundancy the topography is also the most varied and difficult to establish any consistency in new development.



# 3 - A New Suburban Form

Based on the existing physical connections of the site, relationships to established public amenities, and adjacency to higher density housing; Neighborhood A - Brookville Seminary Valley was ultimately chosen as the site for redevelopment. By introducing more permissive zoning regulations, this community can evolve to more than an island of single use and single family homes.



## BROOKVILLE SEMINARY VALLEY

40' 80' 160' 320'

- Existing Buildings
- High and Medium Density Residential Areas

- Primary Corridor
- Secondary Corridor

- Public Open Space

5 Min Walking







## **PHASE ONE - 2018-2025**

The first step in implementing this change comes from establishing access to local amenities by dedicating the two primary bisecting streets of Taney and N. Pickett as mixed use commercial. For businesses along those streets to be successful, a greater local population is needed to support them. Therefore, 2-family residential and lot-subdivision is permitted in the areas off these streets to encourage a bolstering of the community's numbers.

 **New Commercial**

 **New Residential**

 **New Lot Division**



## **PHASE TWO - 2025-2045**

As the main streets' businesses grow and become successful, the value of the surrounding area increases financially. This increase benefits current residents who will see their real-estate investment grow while also having the opportunity to capitalize on that growth with the relaxed sub-division and rental regulations. Developments shift away from large single family dwellings to take advantage of income potential from multiple and mixed used commercial/residential opportunities.



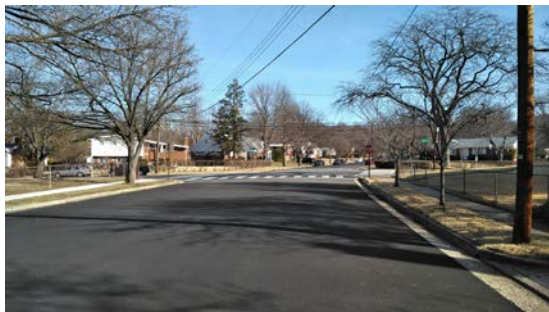
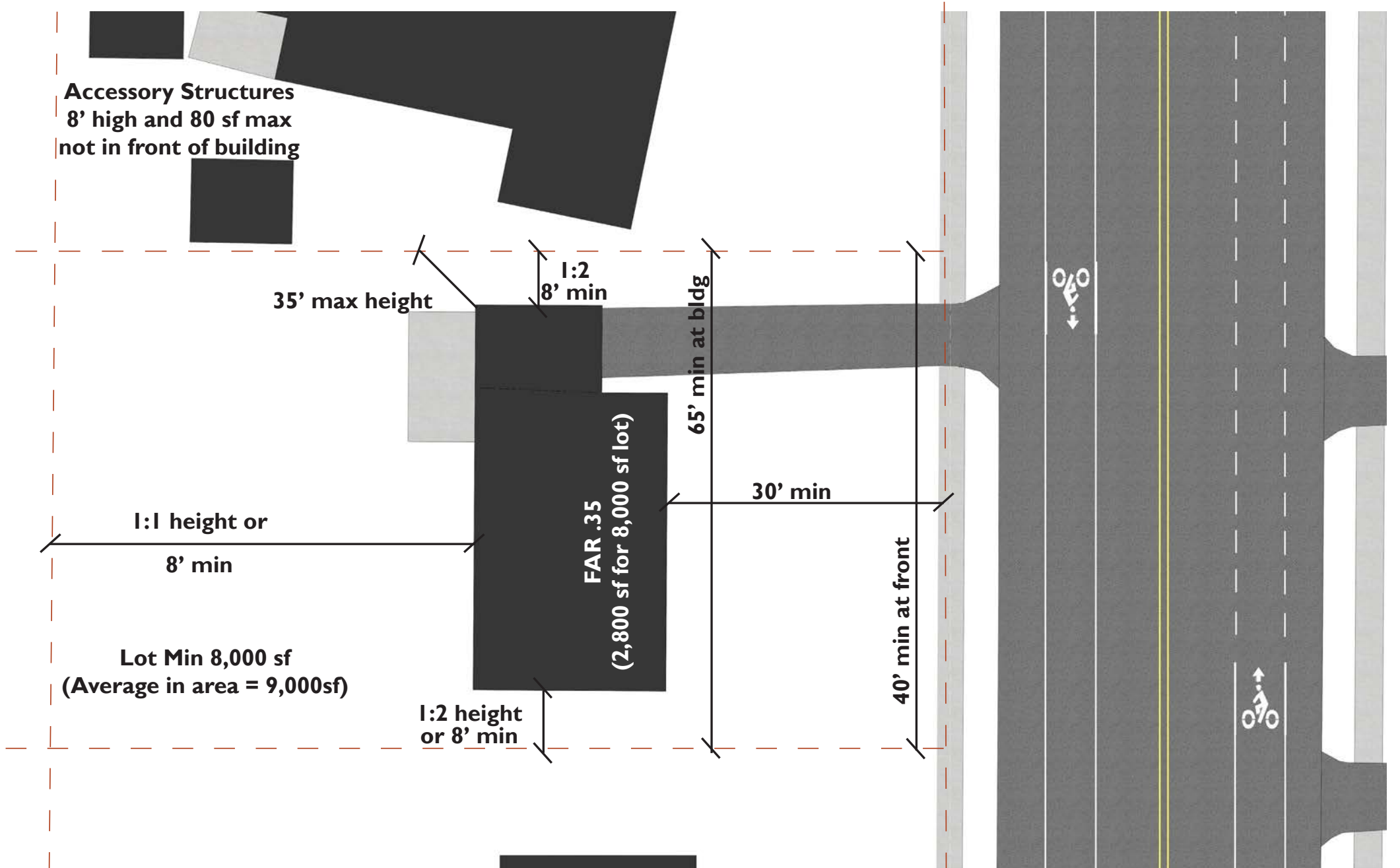
## **PHASE THREE - 2045+**

The established commercial district, having attracted an increased population to the surrounding area brings in a significant increase in both business and property taxes for the city. This money is reinvested in upgrading the infrastructure and environment of the now-century old community. Aspects of pedestrian access are promoted and the remaining necessities of utilities and waste are relocated from that realm.



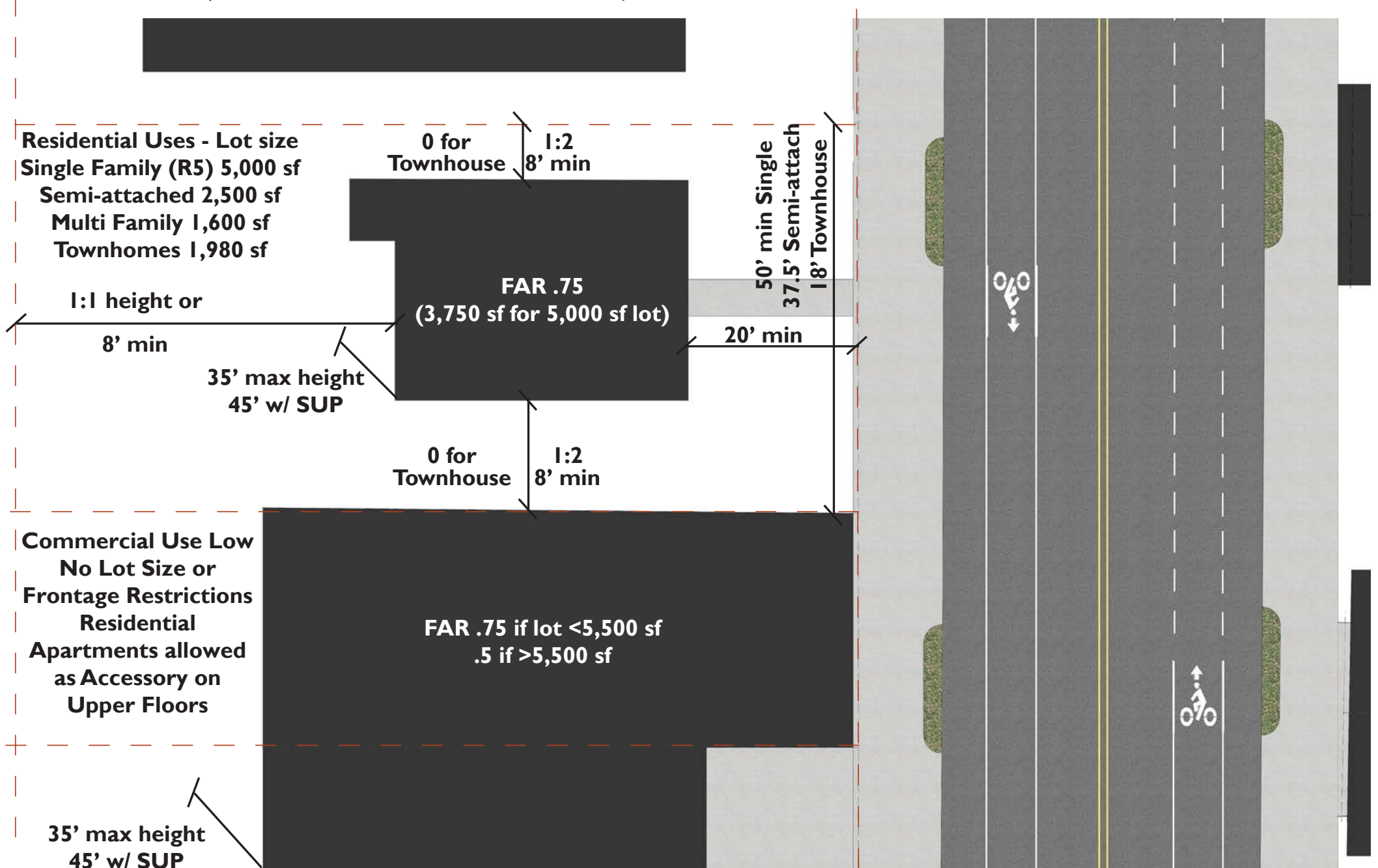


# EXISTING R-8 - Main Corridor (Taney Ave)



Achieving the vision of that 50 year plan starts with establishing the set of rules that will allow and promote the conversion of what is currently zoned as R8 to either commercial or multi-family residential.

# NEW CL (Commercial Low) - Main Corridor



Hamilton, Ontario - Photo by Rick Cordeiro - Public Domain  
<https://upload.wikimedia.org/wikipedia/commons/4/4c/LockeStreetHamilton.JPG>



Barracks Row, Washington D.C. - Google Street view Sept 2017

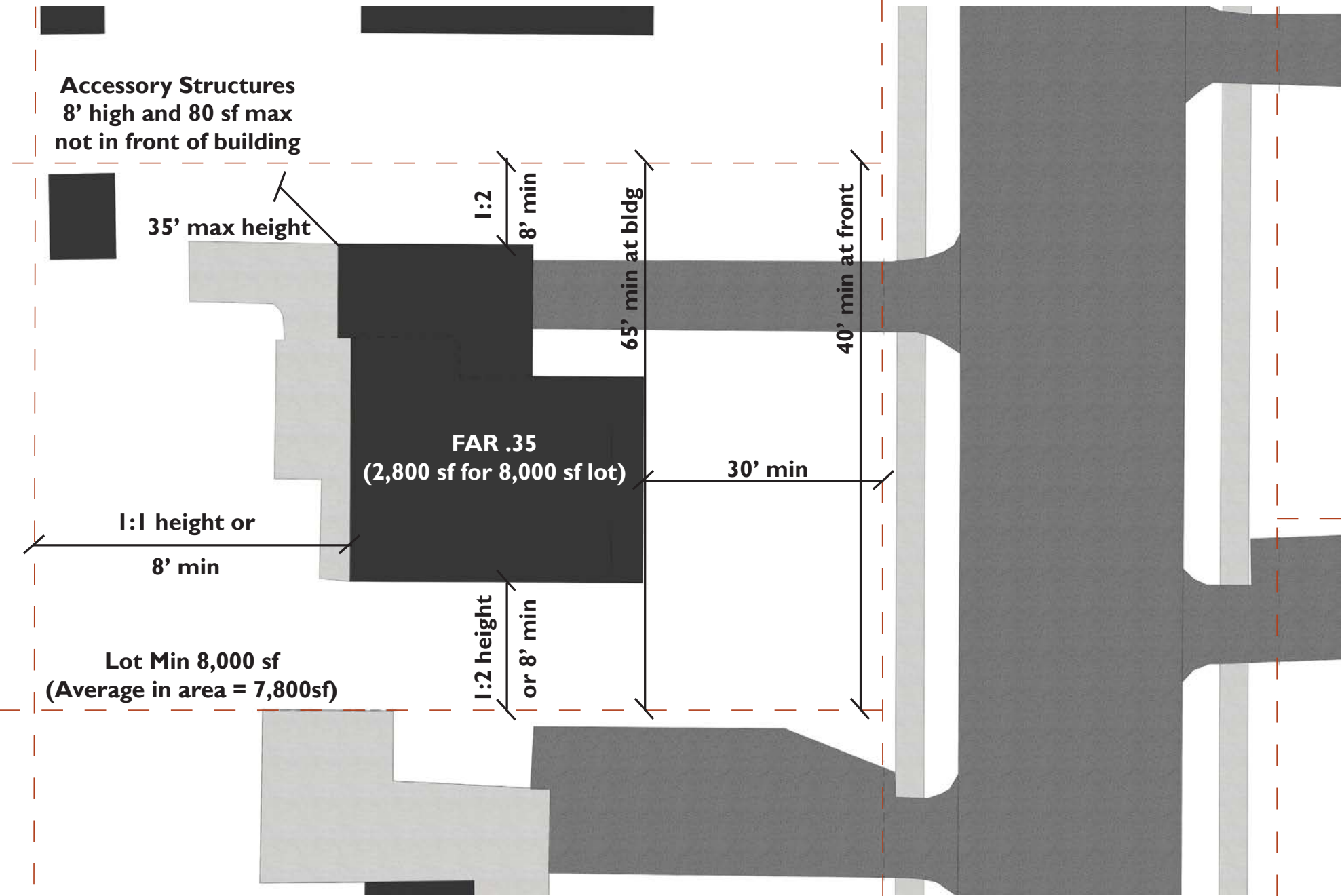


Del Ray Alexandria, Virginia  
 Google Street View Sept 2017

The proposed main streets already have the width necessary for the increased traffic a commercial boulevard such as the examples shown here would attract.

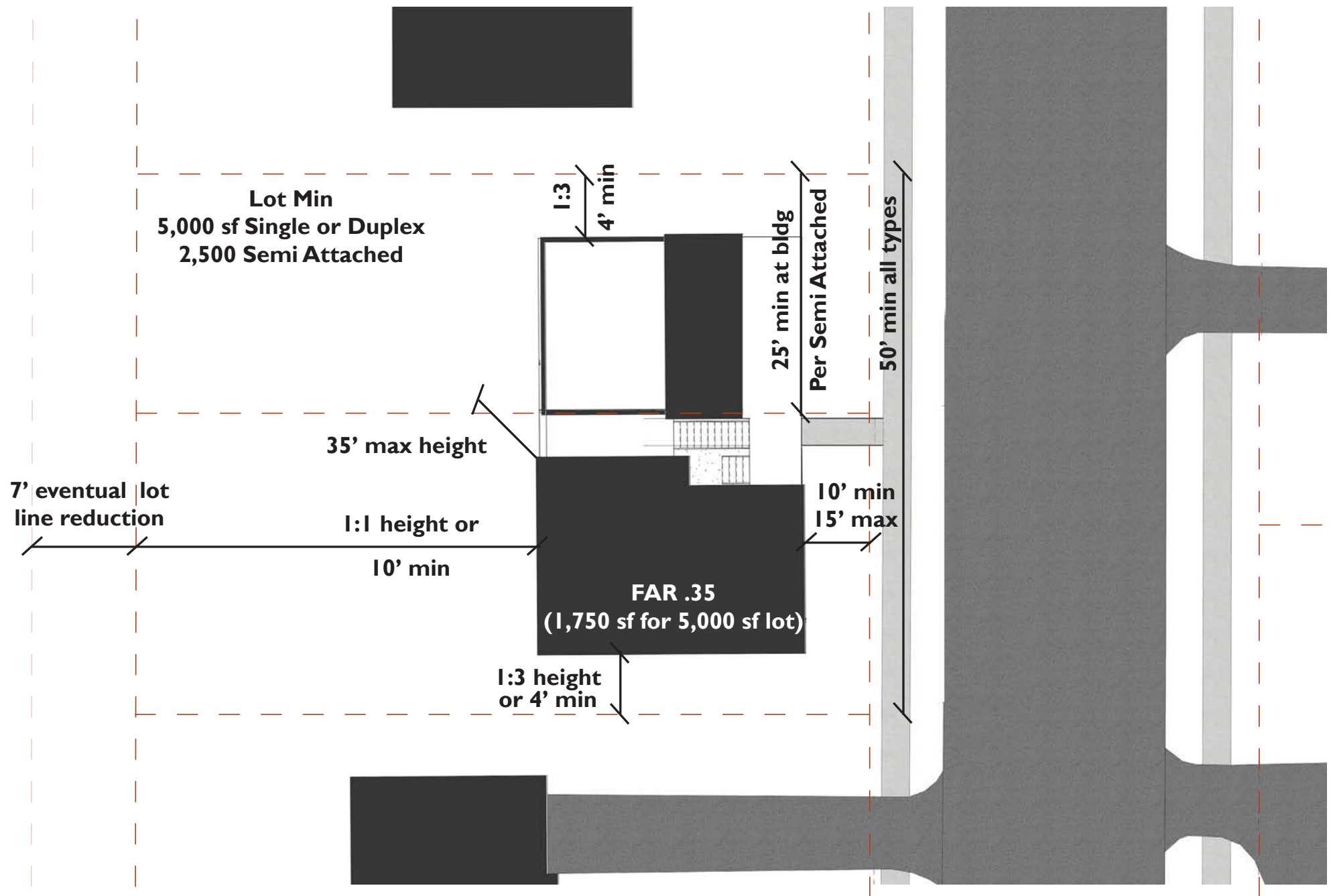
The main change would be allowing for smaller lot subdivisions, zero lot lines, and tax incentives for new commercial development to initiate the process.

# EXISTING R-8 - Secondary Residential



With regards to the secondary residential streets, the zoning changes are even less drastic. The existing fabric is already structured in a way that new multi family structures could feasibly be introduced with little need for alterations to already established ordinances of that use. At the same time, the R2/5 zoning use being proposed would still allow for the construction of single family homes, introducing a broader variety of housing options.

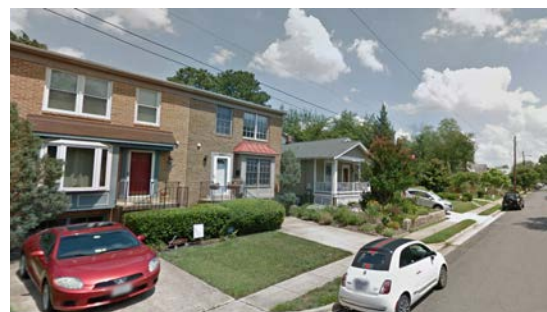
# NEW R2/5 - Secondary Residential



Calgary, Canada - Google Street View Jan 2018



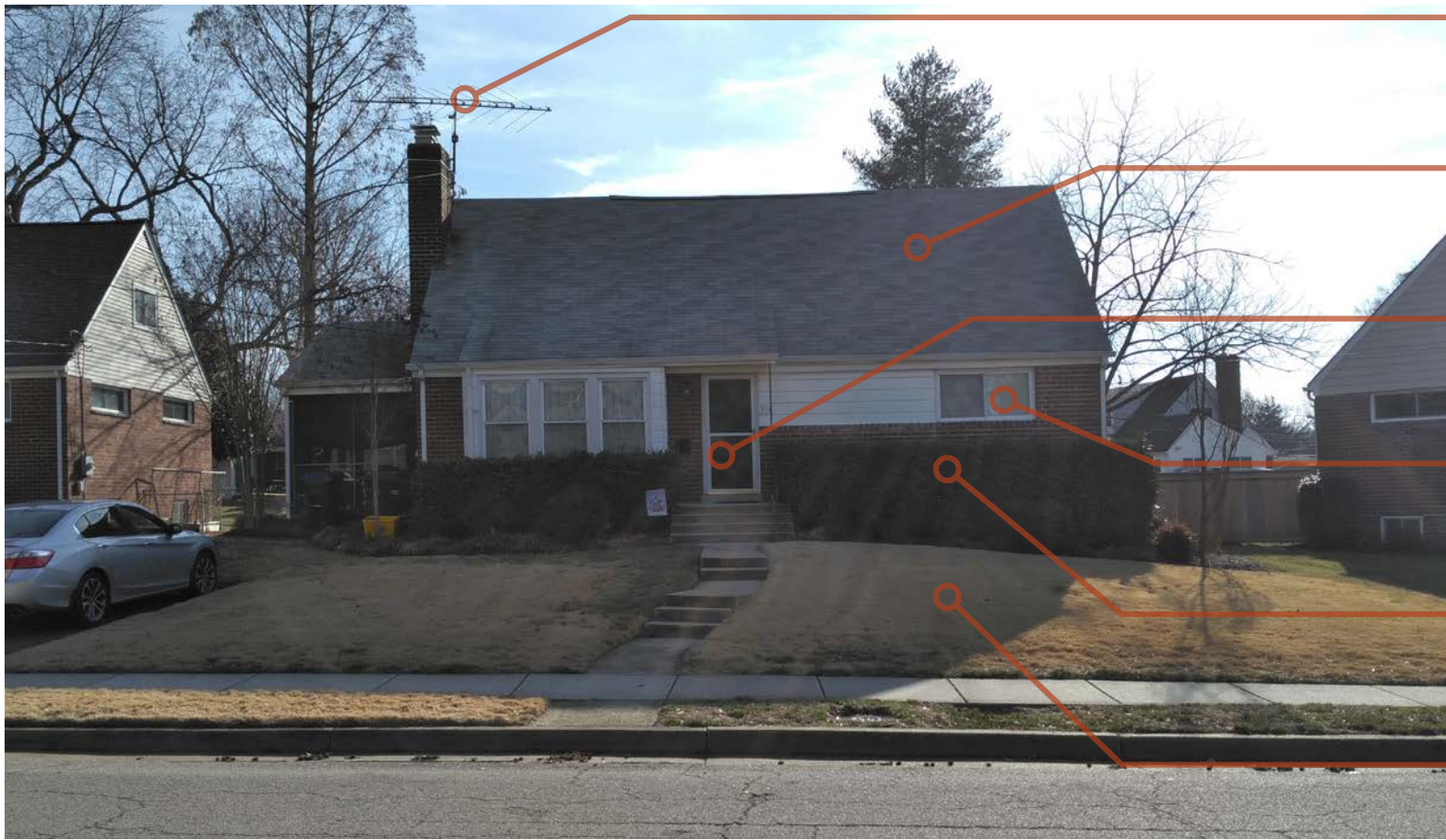
Hamilton, Ontario - Google Street View - July 2015



Del Ray Alexandria, Virginia - Google Street View Feb 2018

Overall lot and building areas would remain pretty consistent during the transition. The key change from established code comes in a reduction of the minimum allowable lot width from 37.5' to 25'. Other changes include an increased setback for the back of lot in preparation for new utility access and a new maximum allowable front yard set back so that new properties can effectively engage with the street. Zero Lot Lines would be allowed at locations of newly subdivided plats.

## EXISTING FORMS



Visible clutter

Pitched roofs

No porch

Small windows

Limited materials

Empty, open lawns

## EXISTING ENVIRONMENT



Visible and expansive utility infrastructure

Non-functional shading devices

Rain water drains to street

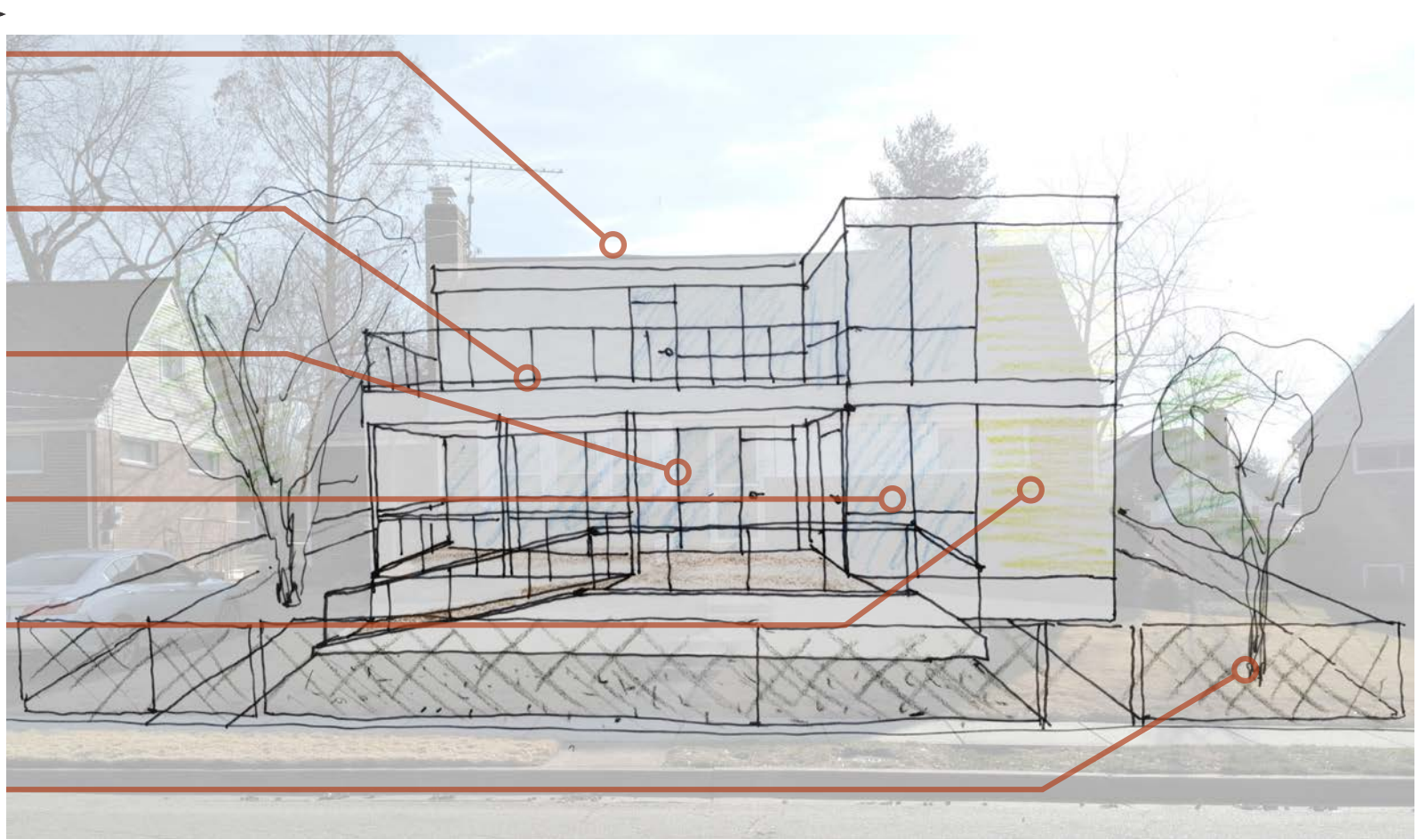
No consideration for site and solar conditions

Supplemental water needed for grass



## NEW ALLOWANCES

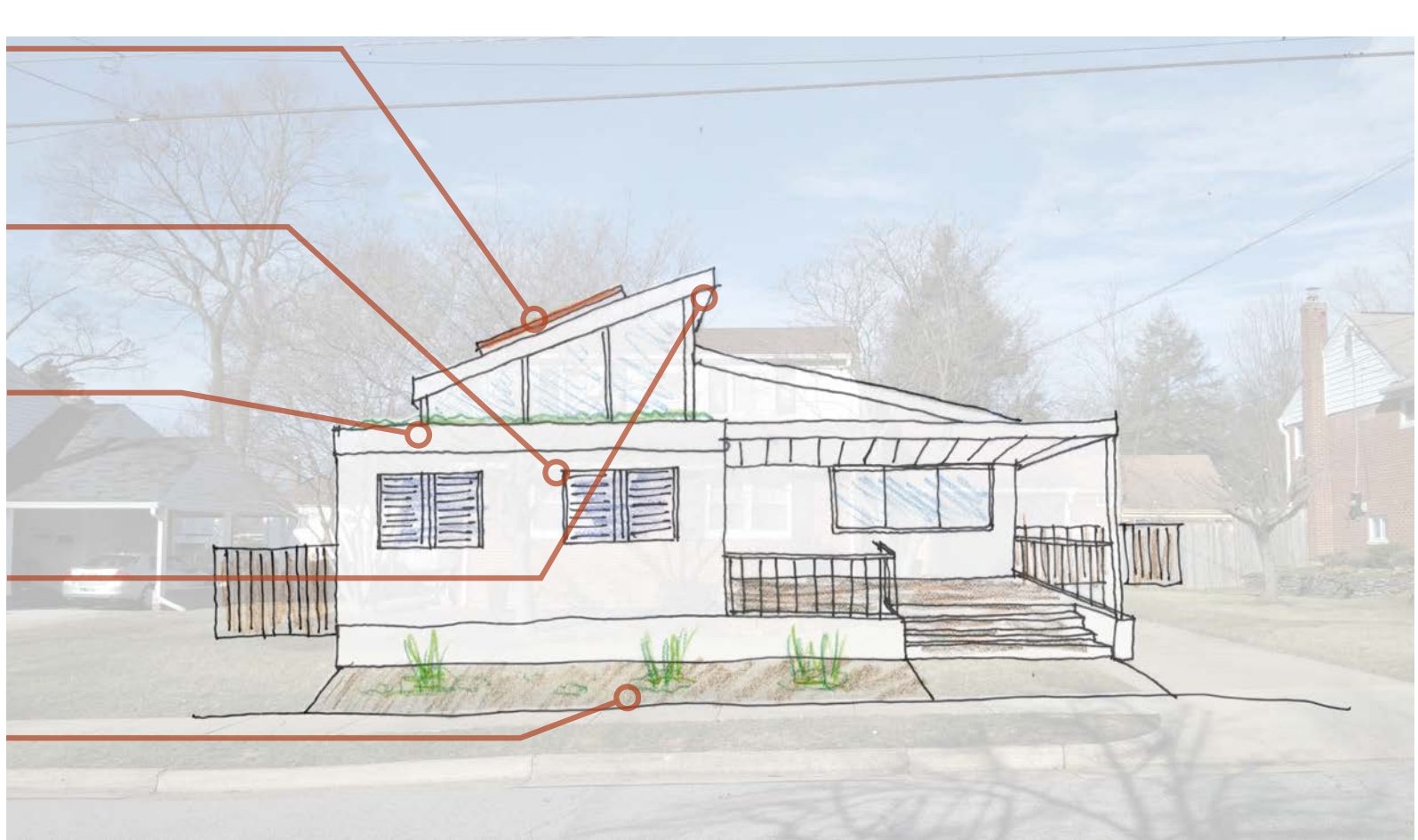
- 
- Devices moved to behind structures
- Flat and habitable roofs permitted
- 1/3 Of front structure to be exterior porch
- Full glazing in front and back side windows only above 1st story
- Pallet to expand beyond brick and siding
- Lawns with new planting, half height fencing allowed



The two illustrations show the new formal and environmental drivers which will determine the final shape of the new neighborhood. Primary among them is the relationship between adjacent units. The close proximity requires that side walls be left solid for privacy between units and to allow for an infill opportunity. Since the stated goal of this type of development pattern is to increase density, it should plan for a future where that type of growth can continue.

## NEW REQUIREMENTS

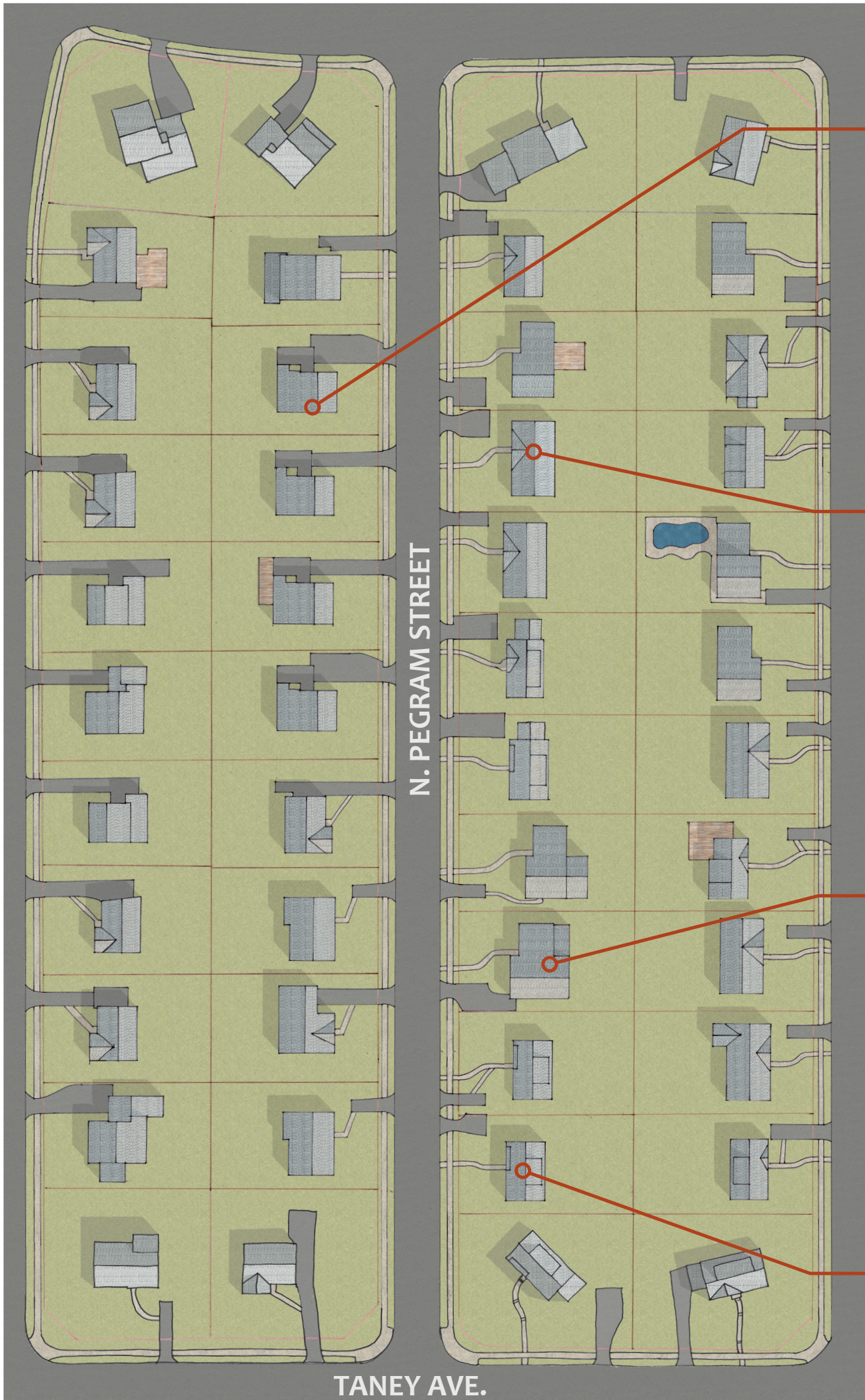
- 
- Utilities moved below ground, on-site production encouraged
- Passive shading
- Green roofs for on-site water management
- Building position relates to site and southern exposure
- Rain gardens in lieu of grass

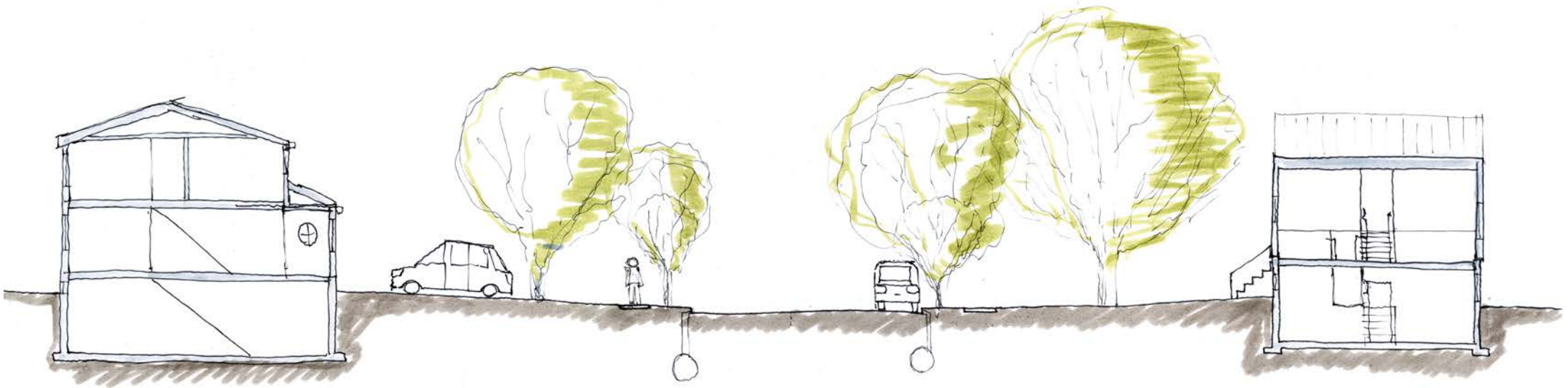


# EXISTING SITE PLAN



# BUILT CHARACTER





4' 8' 16' 32'

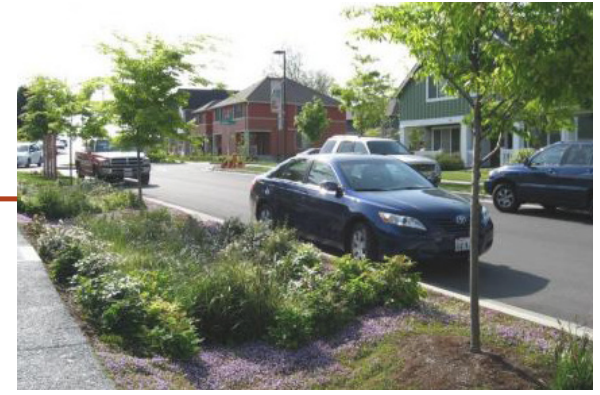
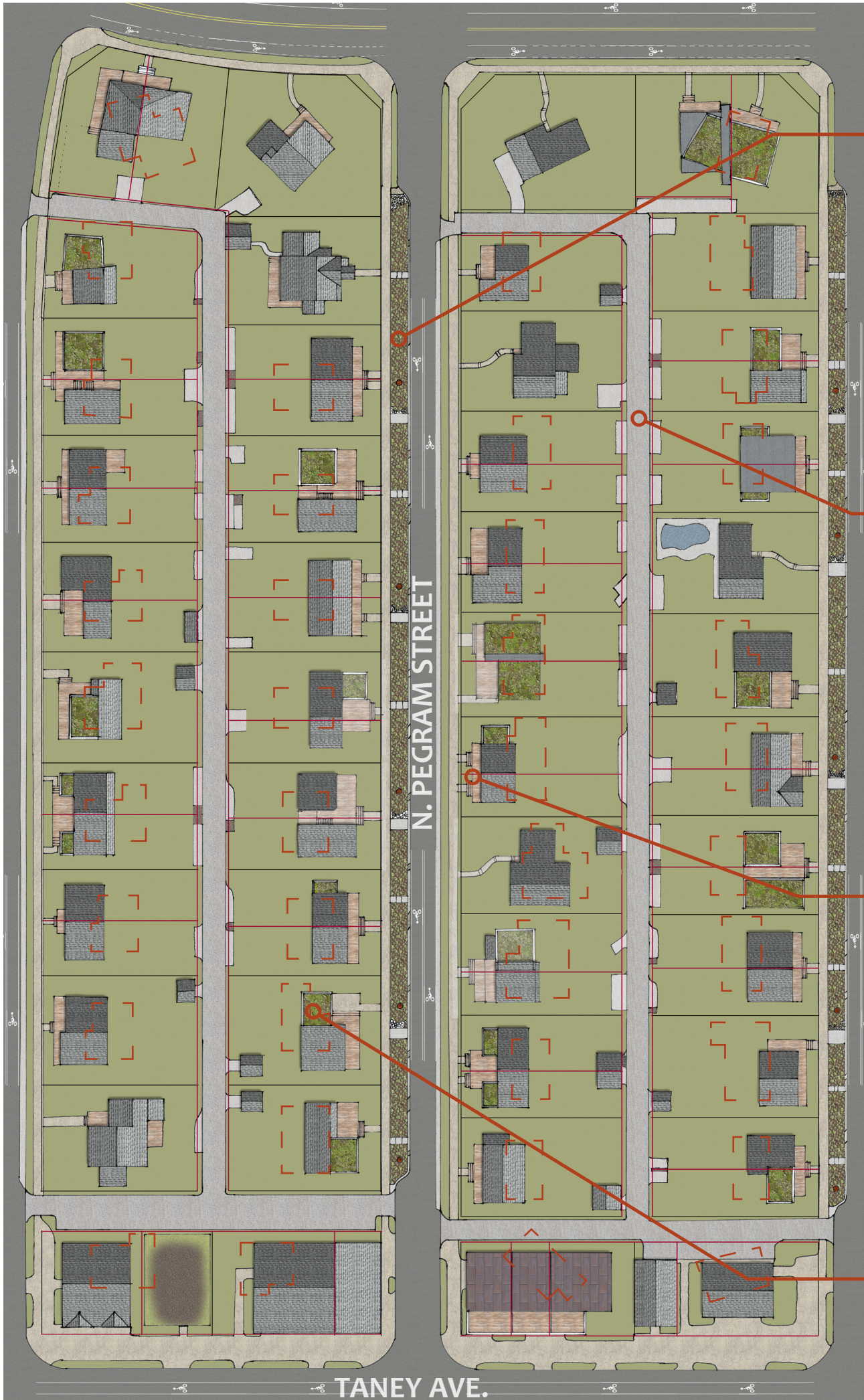
The overall qualities these zoning and formal requirements would change are best exemplified by comparing the existing character with the new. As shown in the photographs, site plan and section, the existing homes tend to be centered on their lots, pulled back and disengaged with the narrow concrete sidewalks. Every home has a curb cut for, at the least, a single-car driveway and though most have a paved connection from sidewalk to front door, some do not. The entire effect is one clearly built with the driver's needs taking precedence over the pedestrian. Worth maintaining however, is an established growth of large trees both in the front yards and along the pedestrian median.



# NEW SITE PLAN



# BUILT CHARACTER



Bio-swales Seattle, Public Domain Image by US Environmental Protection Agency [https://upload.wikimedia.org/wikipedia/commons/9/99/Streetside\\_swale\\_Seattle.jpg](https://upload.wikimedia.org/wikipedia/commons/9/99/Streetside_swale_Seattle.jpg)



Photo from City of Dubuque Green Alley Reconstruction Project, used with permission by City of Dubuque Iowa [http://www.cityofdubuque.org/ImageRepository/Path?filePath=%2fDocuments%5cContent%5c865%5c1429%2fAlley+13\\_Maple+-+Cedar\\_14th+-+15th+St\\_02\\_201410171705223146.JPGII](http://www.cityofdubuque.org/ImageRepository/Path?filePath=%2fDocuments%5cContent%5c865%5c1429%2fAlley+13_Maple+-+Cedar_14th+-+15th+St_02_201410171705223146.JPGII)



Photo by Dennis Schroeder/U.S. Department of Energy Solar Decathlon. Used with permission based on US DoE usage rights [https://farm5.staticflickr.com/4490/23630494708\\_0607d0c646\\_o.jpg](https://farm5.staticflickr.com/4490/23630494708_0607d0c646_o.jpg)



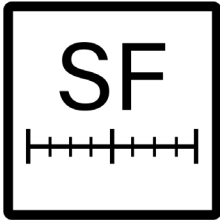
Photo by Dennis Schroeder/U.S. Department of Energy Solar Decathlon. Used with permission based on US DoE usage rights [https://farm5.staticflickr.com/4456/37482564721\\_fb416b1da7\\_o.jpg](https://farm5.staticflickr.com/4456/37482564721_fb416b1da7_o.jpg)



The new formal character is one which engages strongly with the sense of community promoted by this type of growth. Building fronts interact directly with widened pedestrian pathways through the prevalence of the front porches required by new building code. These outdoor spaces not only help promote the engagement of the residents with their neighborhood but act as formal thresholds between the now much closer public walkways, softening that adjacency. Streets along the front lose parking in favor of bike lanes, on-site storm water management in the form of bio-swales, and decreased impervious surfaces overall. New access roads along the back of lots become the home for the remaining personal vehicles and all other forms of utility maintenance to enhance the quality of the pedestrian fronts. Though the locations of buildings closer to the street will result in the loss of some of the existing old-growth trees, efforts are taken to leave those existing along the sidewalk/street buffer and replace any removed with new plantings. As any increase in built density will disrupt natural habitats, initiatives are put in place to provide native species of plantings along the public street and build bat and bird shelters on residents' properties to help maintain the diverse ecosystem.



## TANGIBLE FACTORS



Square Footage: How much space the inhabitant(s) require and/or are comfortable living in.

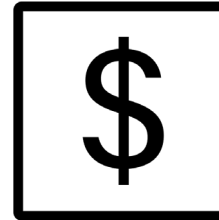


Flexibility: The capacity and willingness of the inhabitants to easily alter their physical space to serve multiple functions.

## INTANGIBLE FACTORS

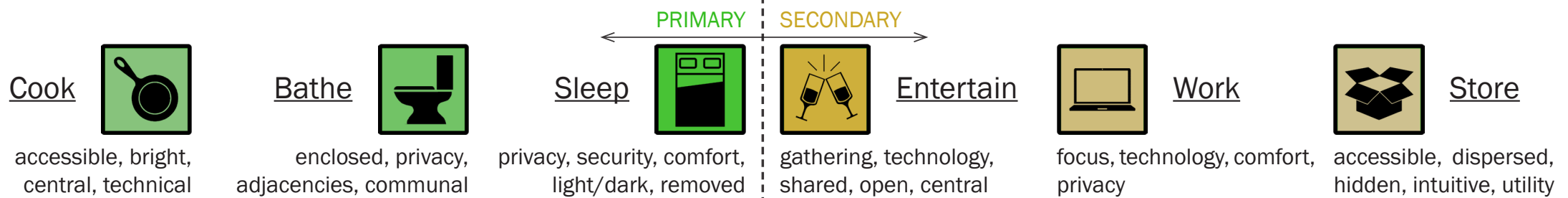


Accessibility: How important being able to easily access and utilize all areas of the space is to the inhabitants.

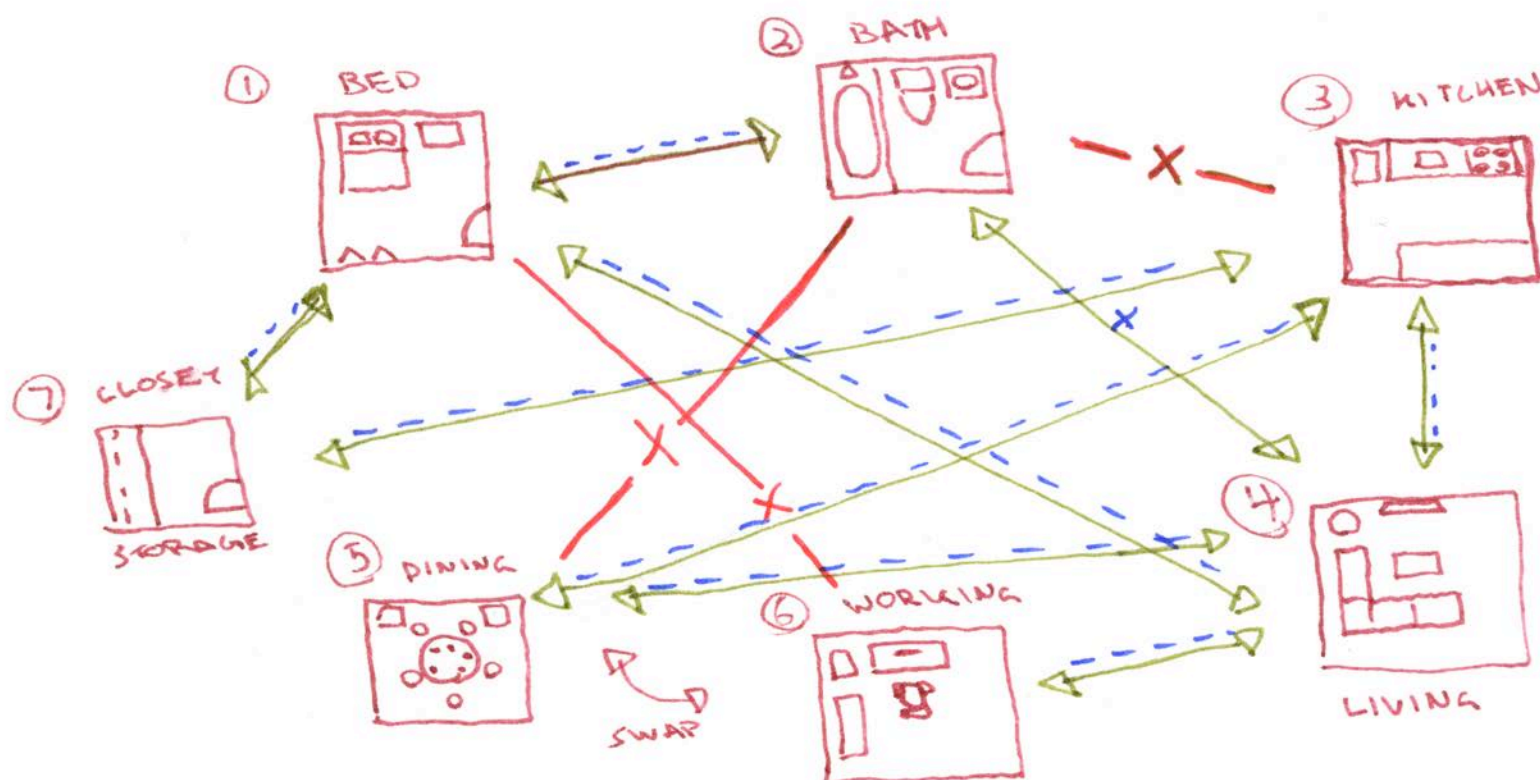


Affordability: Financial situation of the inhabitants, their relative monetary resources available for a home.

## FUNCTIONAL CONSIDERATIONS



## SPATIAL RELATIONSHIP DIAGRAM



# 4 - Defining the Program

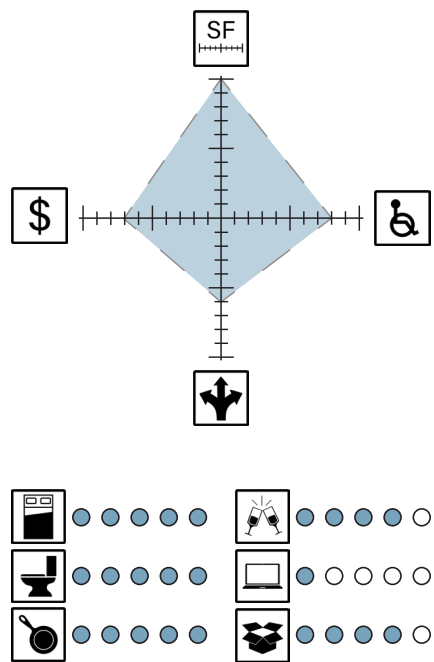
With considerations of built forms at the street level established, the next step is to develop an understanding of the requirements of habitation and how those needs scale to the new range of housing styles and types. The investigations shown here look at the typically understood programmatic requirements of a home and how those elements relate to one another. While most property listings describe a home using a quantity of bedrooms, bathrooms, and the material of the kitchen countertops, these factors ignore the relationships of those spaces to each other and the inhabitant.

If a development is to provide more living spaces for more people in a smaller overall footprint, the functions of that living space must respond in as much a qualitative way as quantitative. Aspects of needs versus wants and considerations of how those needs will change with time are critical in providing a home which is adaptable and relevant in the long term.



These tangible and intangible factors in combination with the functional considerations of a home begin to imply the broad extent of housing needs and inhabitant types beyond the nuclear family that a community is comprised of. The needs, concerns and desires of a diverse cast of players are essential to a successful design as they establish unique and varied sets of architectural requirements.

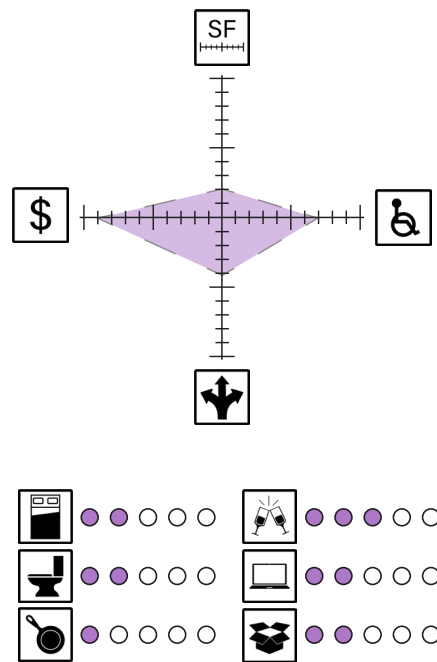
THE THREE GENERATIONS



"Now that our youngest is in college, my parents have moved in. We need a home in which we can all be together but still maintain independence as we get older."



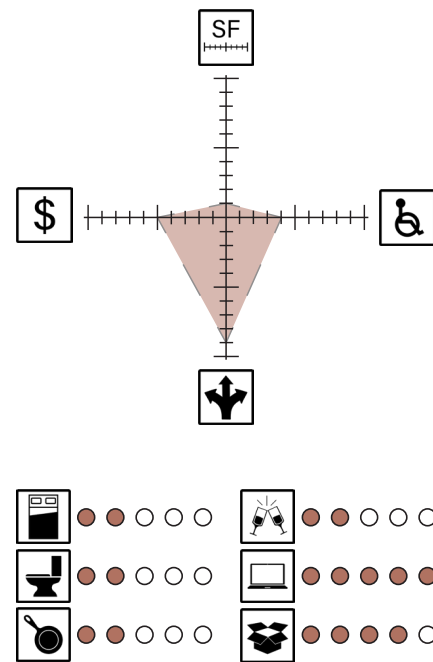
THE RETIREES



"We're looking to downsize and enjoy our Golden Years but want to stay close to our family and friends."



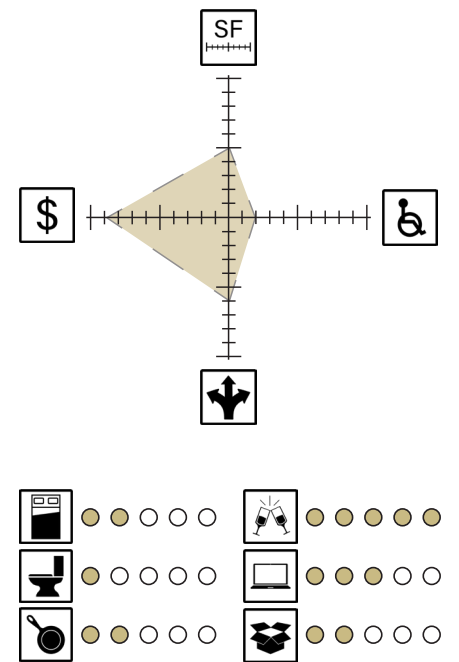
THE ENTREPRENEUR



"Being a single parent is tough. I'd like to be able to establish my business in my home to be near my kids but still have a space to meet with clients and work effectively."



THE DINKS



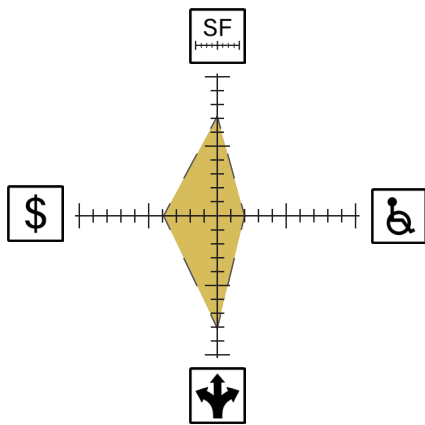
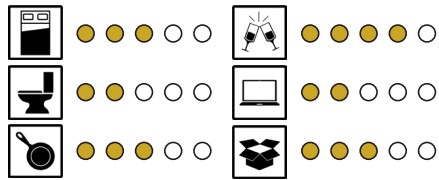
"An active and diverse neighborhood is crucial. Our home needs to support social and creative functions more than anything."





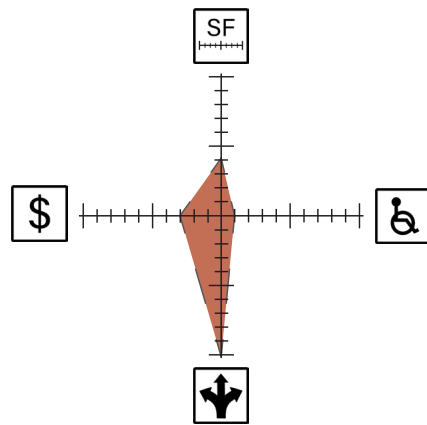
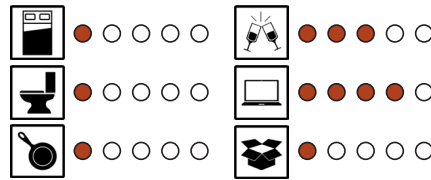
"We're a few years out of school and are getting help on the cost of homeownership with my brother. We need a space which can balance privacy with shared living areas."

**THE ROOMMATE**



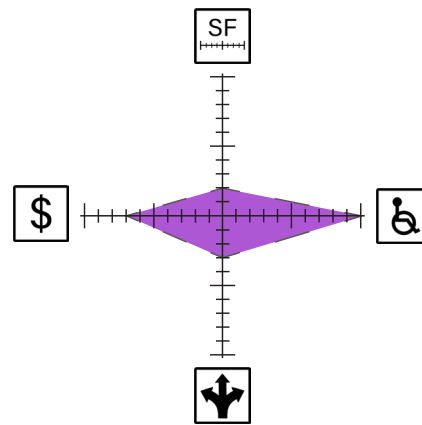
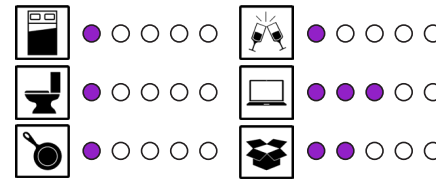
"I need something practical and efficient and like the prospects of being a part of a community rather than jumping from lease to lease."

**THE YOUNG PROFESSIONAL**



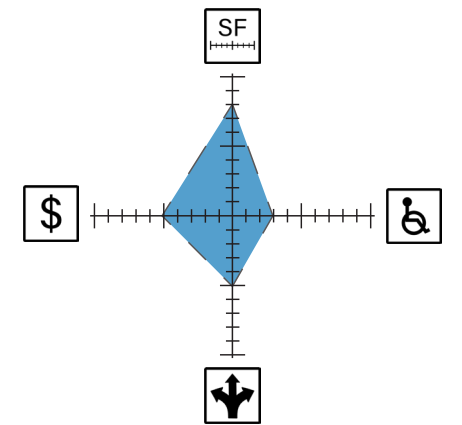
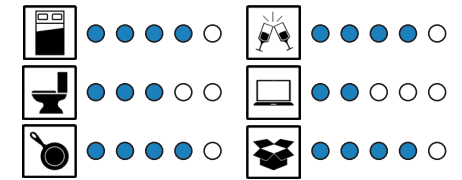
"My home needs to make living alone at my age safe and practical at a scale I can maintain. I still would like to be engaged with the community and maybe offer piano lessons to the next generation in the neighborhood."

**THE INDEPENDENT ELDER**



"While our home needs to comfortably support the hectic lives of parenthood, the local community and schools are just as important."

**THE NUCLEAR FAMILY**



These are just a sample of the faces which comprise the new community. It is difficult to imagine even half of them being well served by the fabric of the Single Family Suburb as it is currently established to function. However, with the variety in built forms and inhabitation types permitted by the new development, and that development's connection to walkable amenities, the same area can now serve a greater range of residents: the octogenarian can reasonably age in place, the single parent school teacher can afford a quality home near her work, and the recent grad can live in Mom and Dad's single bedroom apartment suite rather than living with Mom and Dad. The differences between now and what can be available are brought about not by bulldozing and starting from scratch but are enacted by the very community they serve. By making simple allowances to what is permissible in new developments, the residents can take active roles in impacting the housing market.



40' 80' 160' 320'

To exemplify the potential of this owner driven housing market in architectural form, three very different households were imagined which might fit in to the established neighborhood 50 years from now. They serve to highlight the variety inherent in a population which acknowledges more than a single family paradigm while also showing how these differences can be integrated within one location instead of segregated by single and limiting uses.



10' 20' 40' 80'

- 3 -  
**Separate  
Structures**

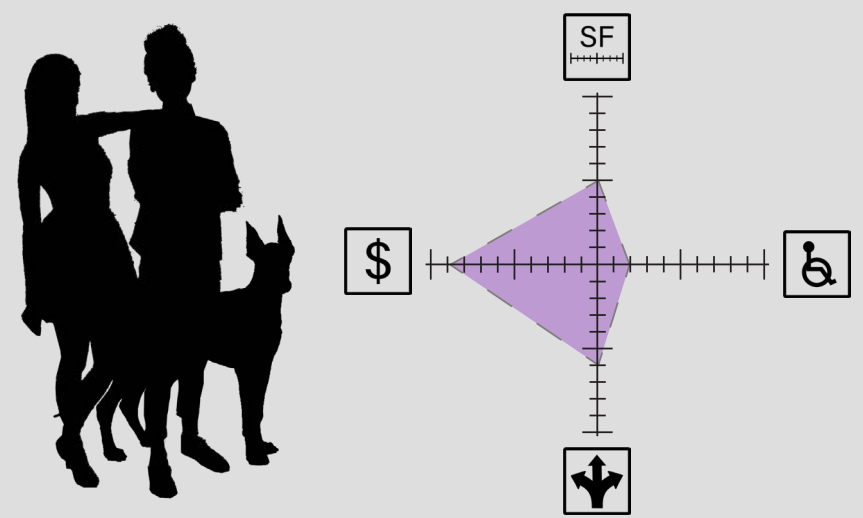
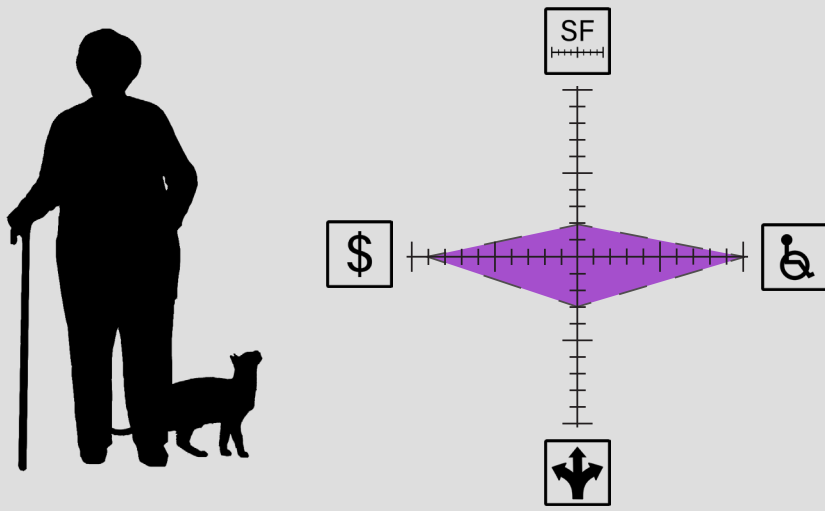
---

- 7 -  
**Available Living  
Units**

---

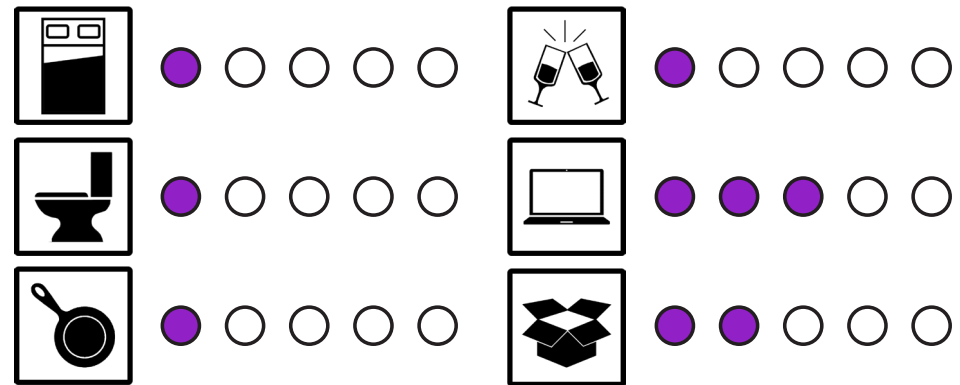
- 13 -  
**Unique  
Neighbors**





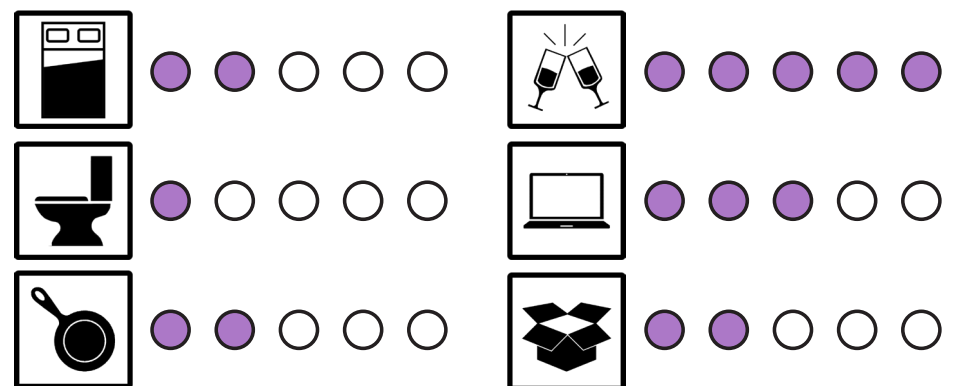
Olivia's key design drivers are accessibility and an efficiency of scale she can manage on her own. While she doesn't plan to host any large groups, she does require a visible and inviting living space in which she could offer piano lessons to other residents. Her other request is a large open yard where she could garden- and a fence to keep Nicole's pet Doberman separate from that space.

### Olivia - 1st Floor Apartment



Nicole works for a lobbyist firm specialized in supporting renewable energy tech manufacturers. As such, hosting and entertaining is a critical component to her position. The public space of her home needs to support that role both for work and for friends. Her wife Marcia's request is a brightly lit studio loft where she can paint and display their eclectic art collection.

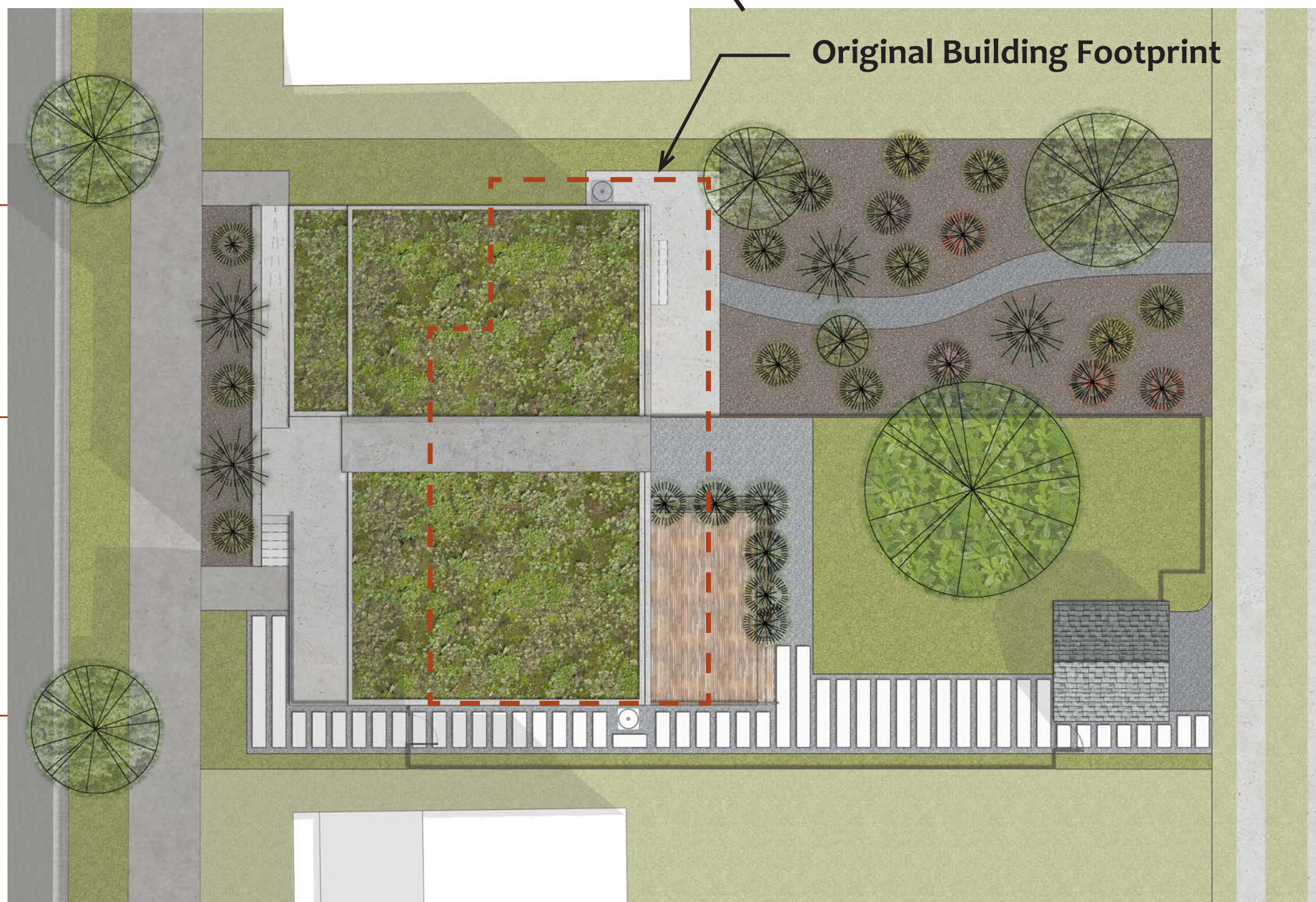
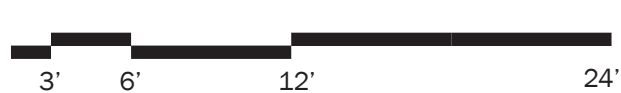
### Nicole and Marcia - Primary Duplex



# 5 - Old Turned New

Olivia has lived in this neighborhood in one of its original homes since her 30s. With her husband's passing and more than 40 years of occupancy in an already aging structure, the building has become too much space for someone her age to manage alone. Under the previous pattern of development her options would have been to struggle on in a space not built for her situation or sell and move from the community she has grown to love. However the ability to have multiple independent living units on a single property gives her the option to build a new home that works for her needs in conjunction with an attached unit she can rent to cover costs. Who she ends up finding for that second unit is her granddaughter Nicole, and Nicole's wife Marcia. The younger couple are both active socially and the community is very attractive to their lifestyle. That they can be near their grandmother while everyone still enjoys their independence makes the situation a perfect fit.

## Site Plan



# Plan Legend

- 1. Dining/Kitchen
- 2. Living
- 3. Washroom
- 4. Bathroom
- 5. Bedroom
- 6. Studio
- 7. Balcony
- 8. Storage/Utility



1st Floor Plan

1' 3' 7' 15'





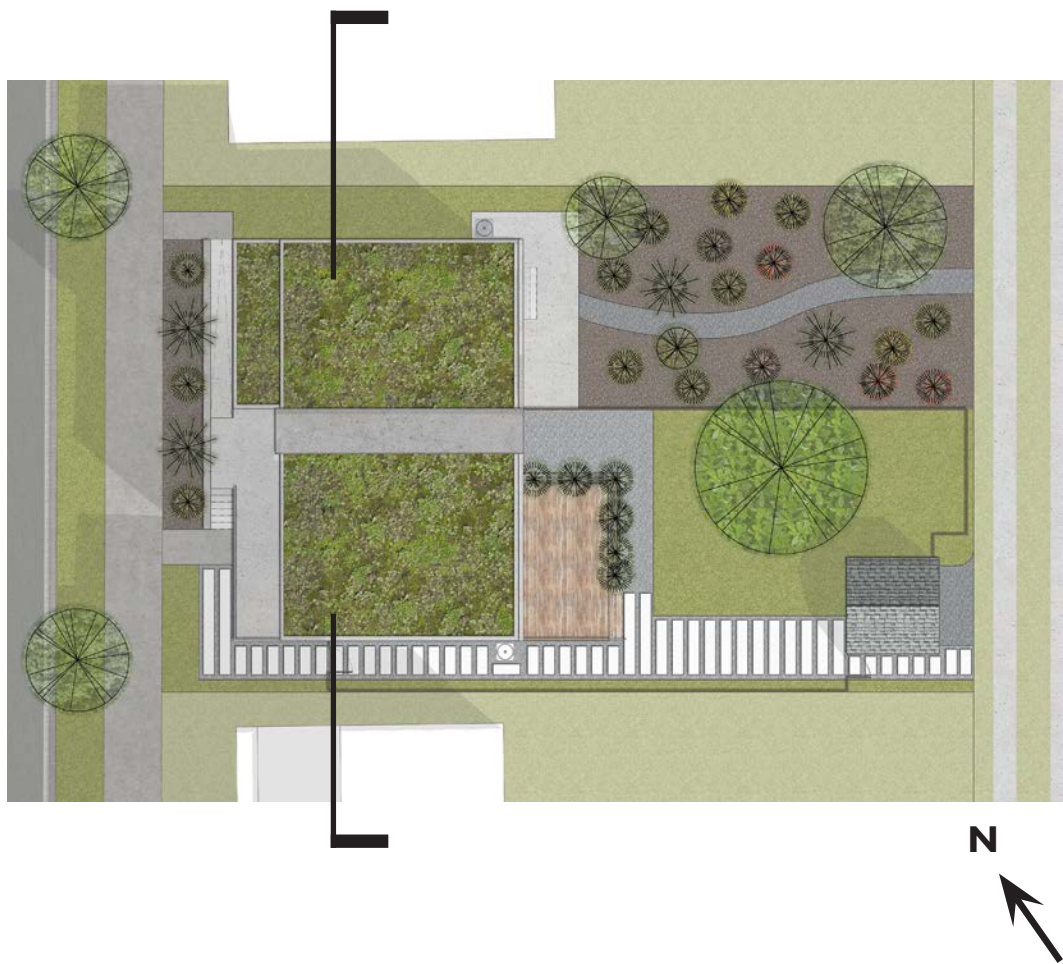
**2nd Floor Plan** 1' 3' 7' 15'

The home is organized to capitalize on the light coming in from the east and west exposures while focusing utilities on the north, south, and center. Keeping these walls as solid elements helps with privacy between the neighboring homes as well as anticipates the potential of townhomes in the future.

The diagram below shows how the grandmother's home can be incorporated after her passing to expand on the entertainment space of the primary home while still leaving a rental or small guest suite available.



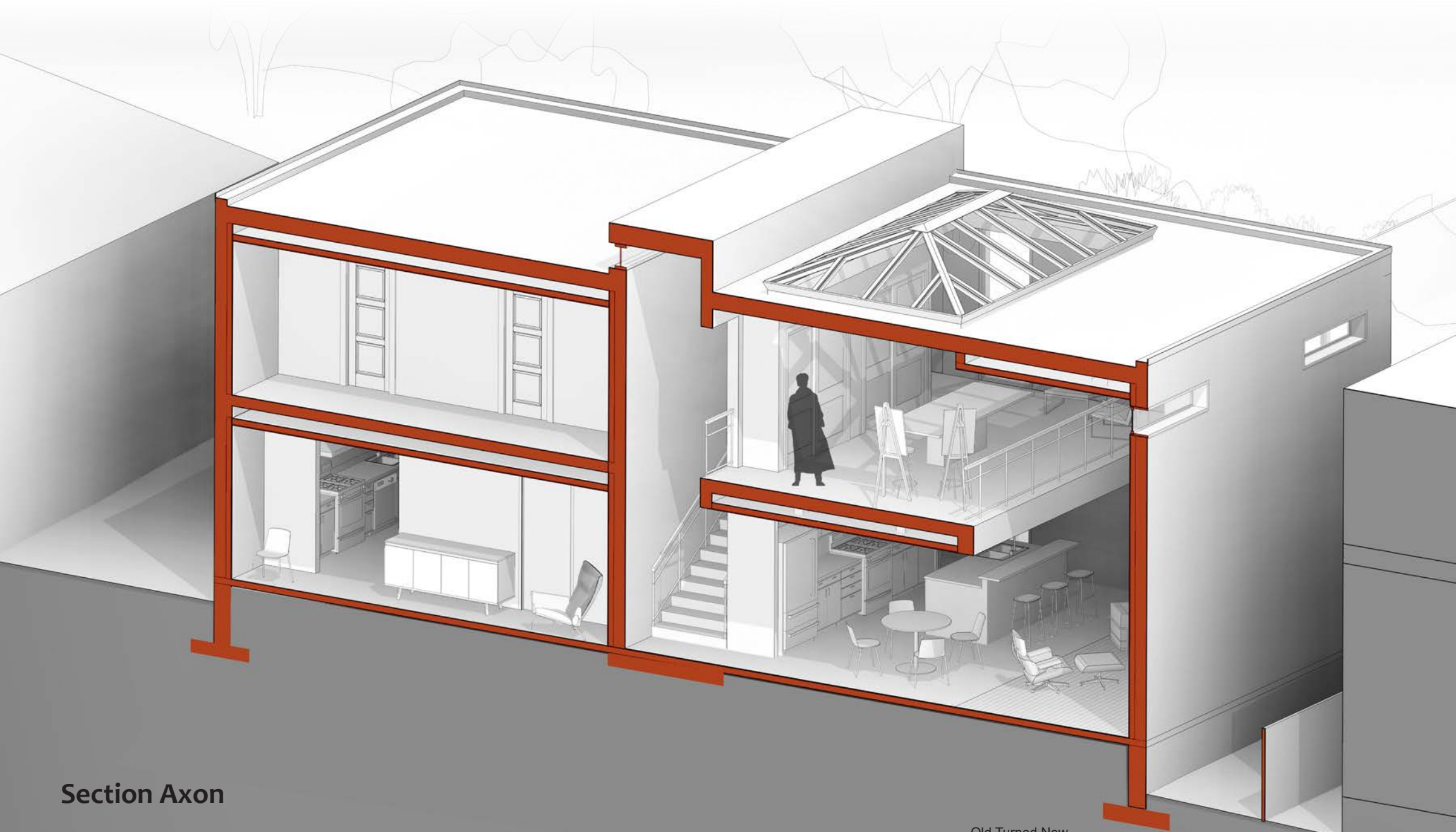
2' 6' 14' 28'



The simplicity of these planar elements and the way they divide the space is shown in the section axon. Cantilevers and dropped ceilings bring intimacy to certain focused or private functions of the residents with open volumes to bring in light and grandeur to the higher energy areas.



The front facade shows the relationships of interior functions and the layers of public to private space. The design uses concrete - or its environmentally friendly counterpart from 50 years in the future - as a material atypical to residential design. The planar forms of this type of construction make the home stand out among its more traditional counterparts but with an approachable and relatable scale. A facade that steps back from the line of the public walkway creates a softer and more dynamic interaction with what is typically thought of as a hard and unyielding material.



Section Axon

Apartment Living Room



Looking South

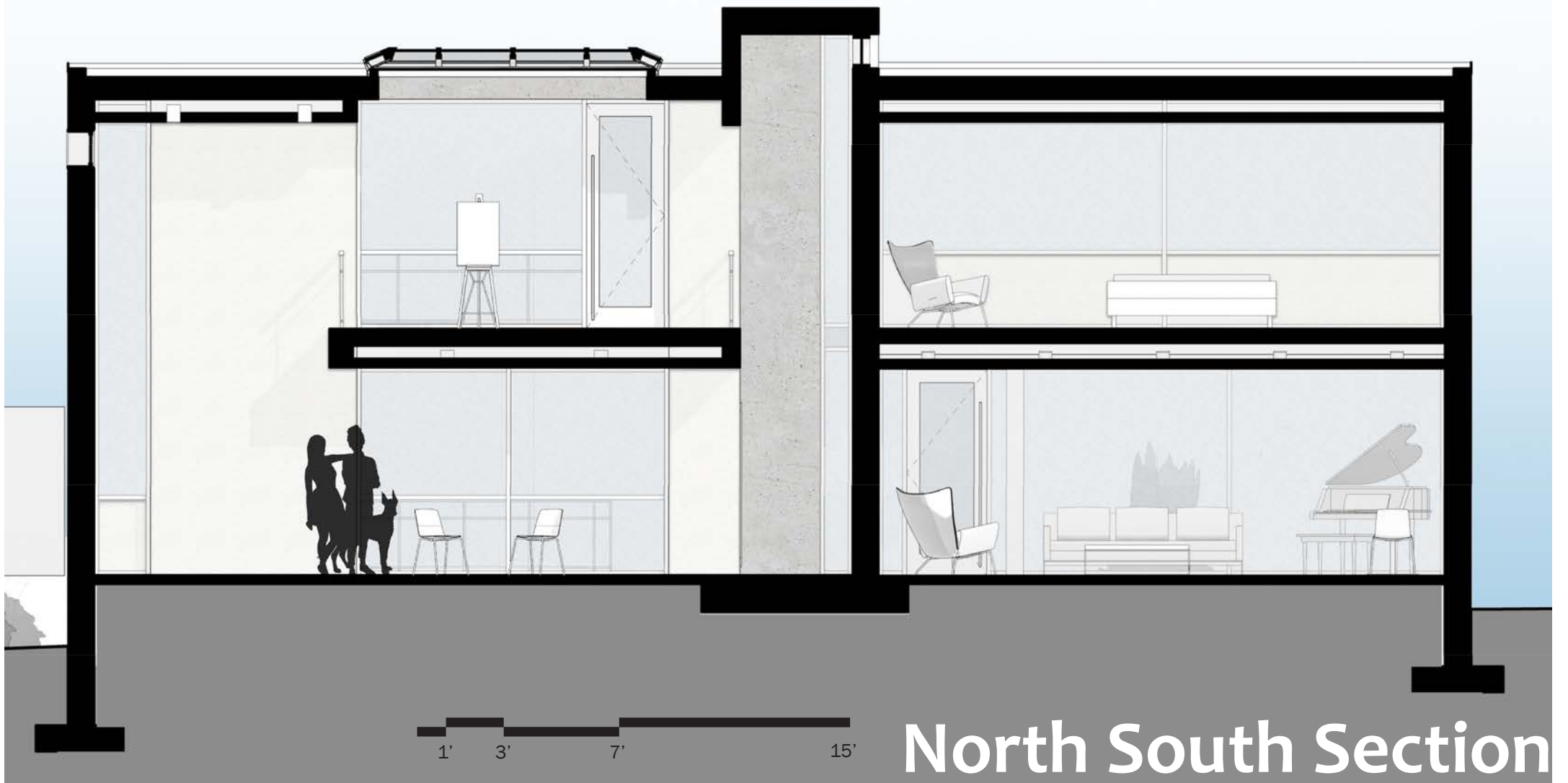
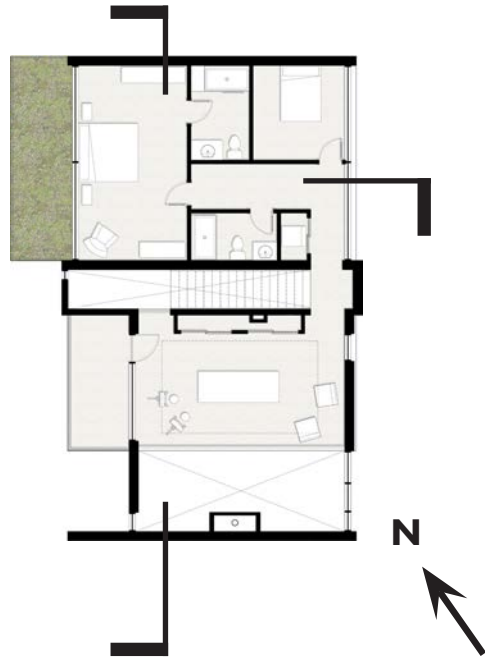


**Main House Kitchen/Den**



**Art Studio**





North South Section

This example shows that the necessary functions of a home, its bedrooms, bathrooms, and kitchen do not always take precedence to the inhabitants. They can be scaled down to fit the individual specific need which generates the opportunity for shared living in a single structure without co-habitation of functions. This also allows the spaces of active residential program, such as the living and dining rooms, to take a more forward role in the design of the home.

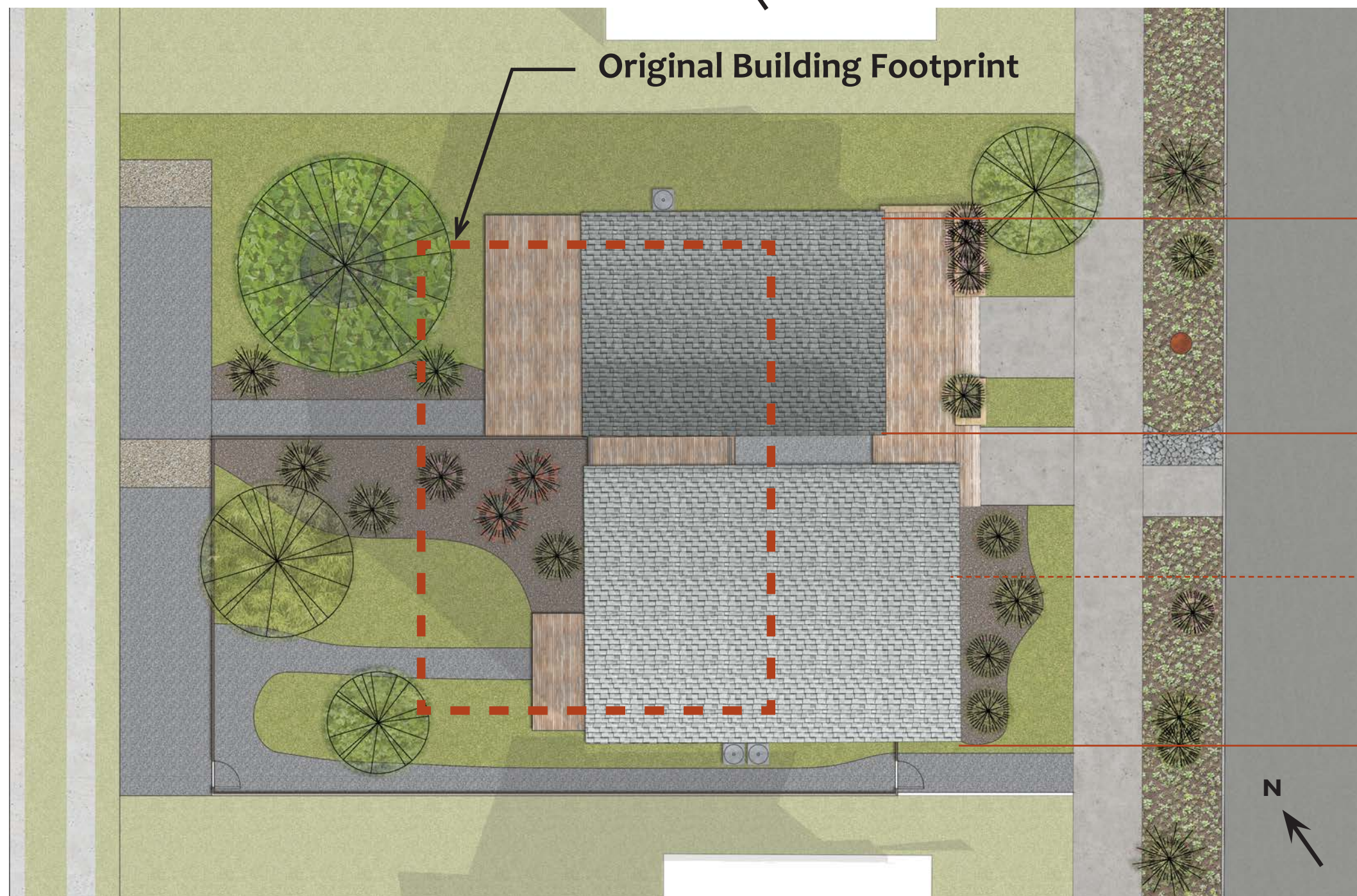


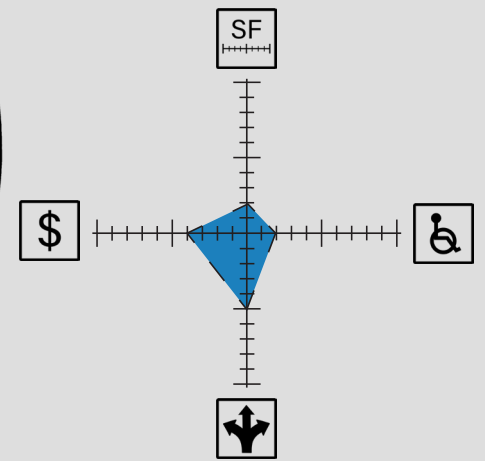
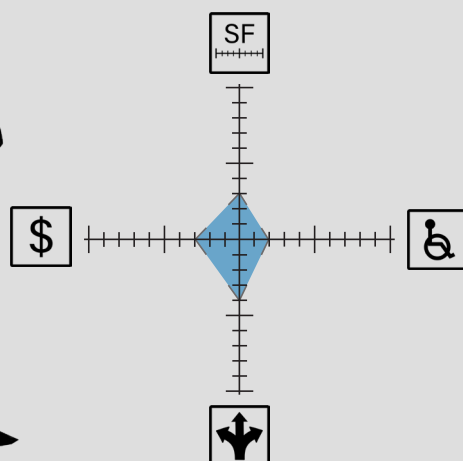
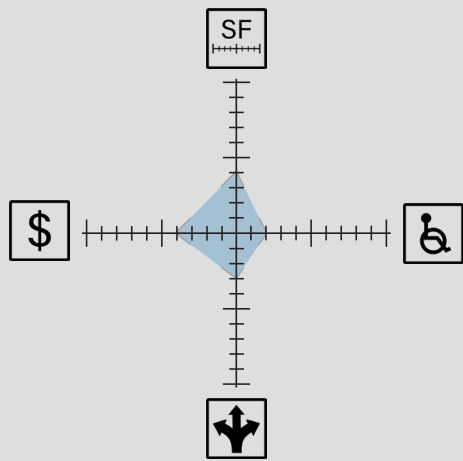
# 6 - New Beginnings

A family is guaranteed to change, whether as an increase through marriage or children, or in the opposite direction through divorce or empty nesting. This structure addresses the needs on the smaller end of the family spectrum and how residents who are potentially in between phases might still find a place in this re-imagined community.

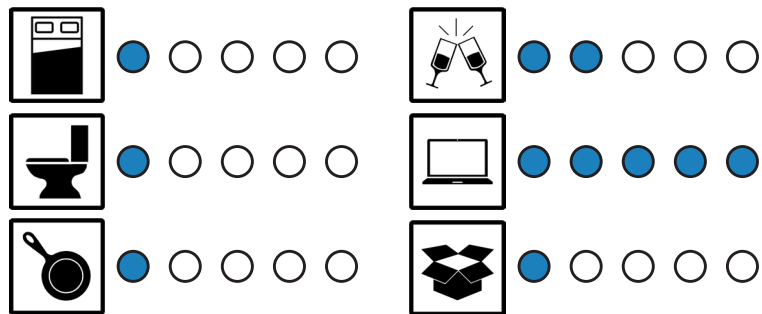
Dave and Sarah are newlyweds fortunate enough to have the savings to purchase property at their young age. Still, the cost to maintain a whole house outweighs their spatial need. Rather than build a home that may or may not be right for them 15 years from now, they instead divided the land to create 3 separate units- one for them and two rentals. If needed, one can be sold while the other above them offers room to eventually grow in to if desired. In the meantime, the rental income assists with the mortgage costs while creating a house-mate communal group without the roommate pains.

## Site Plan



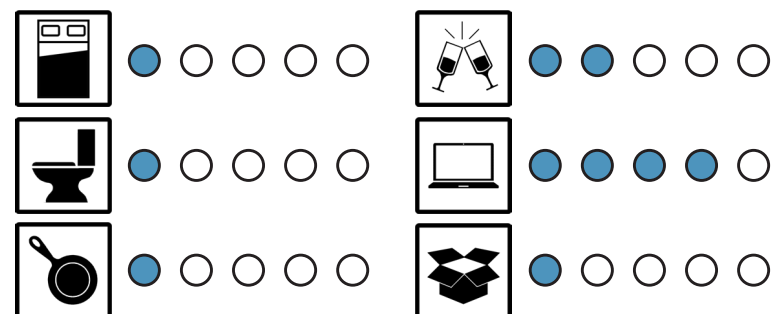


### Kevin - 1st Floor 1 Bedroom



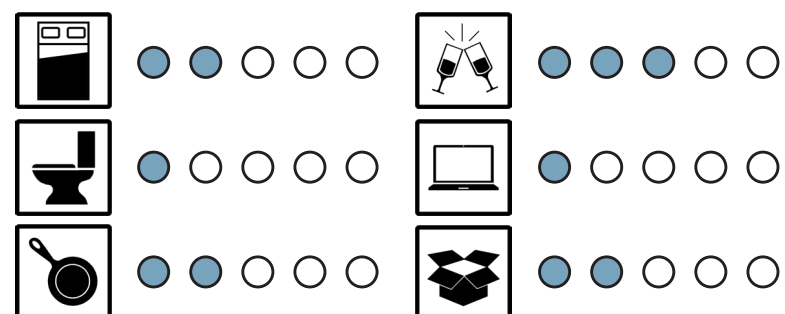
Kevin is a young marketing professional who wants to be in the hip local scene but not right in the city. At this point in his career, he spends a lot of time at networking events but does a fair amount of work from home.

### Dave and Sarah - 1st Floor 1 Bedroom



Dave and Sarah love to meet new people but also want privacy as they begin married life. They plan to recapture one of the rental units once they start a family, but until then want communal social areas as they make friends in their new community.

### Luke - 2nd Floor 1 Bedroom



Luke is newly separated and needs short term accommodations during the transition. He is actively co-parenting and wants to stay near his daughter but also maintain his social life and proximity to his local business.



## Plan Legend

1. Dining/Kitchen
2. Living
3. Bathroom
4. Bedroom
5. Reading Nook
6. Workspace
7. Storage/Utility

### 1st Floor Plan

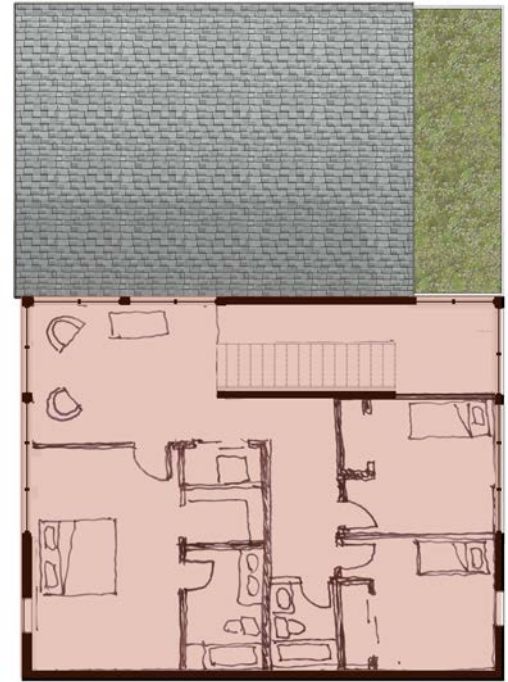


Since two thirds of the building are intended as rental spaces, the programmatic forms were focused on providing for the generic need of a single renter rather than specific functions. The living and kitchen spaces serve as the entry threshold to the interior and remain open to light from the front or back of the home. Kitchen and bath utilities at the core create a separation between the public living and private sleeping spaces. Each tenant has some form of outdoor space accessible to them including a stairwell courtyard the primary residents use for bike storage.





**2nd Floor Plan**



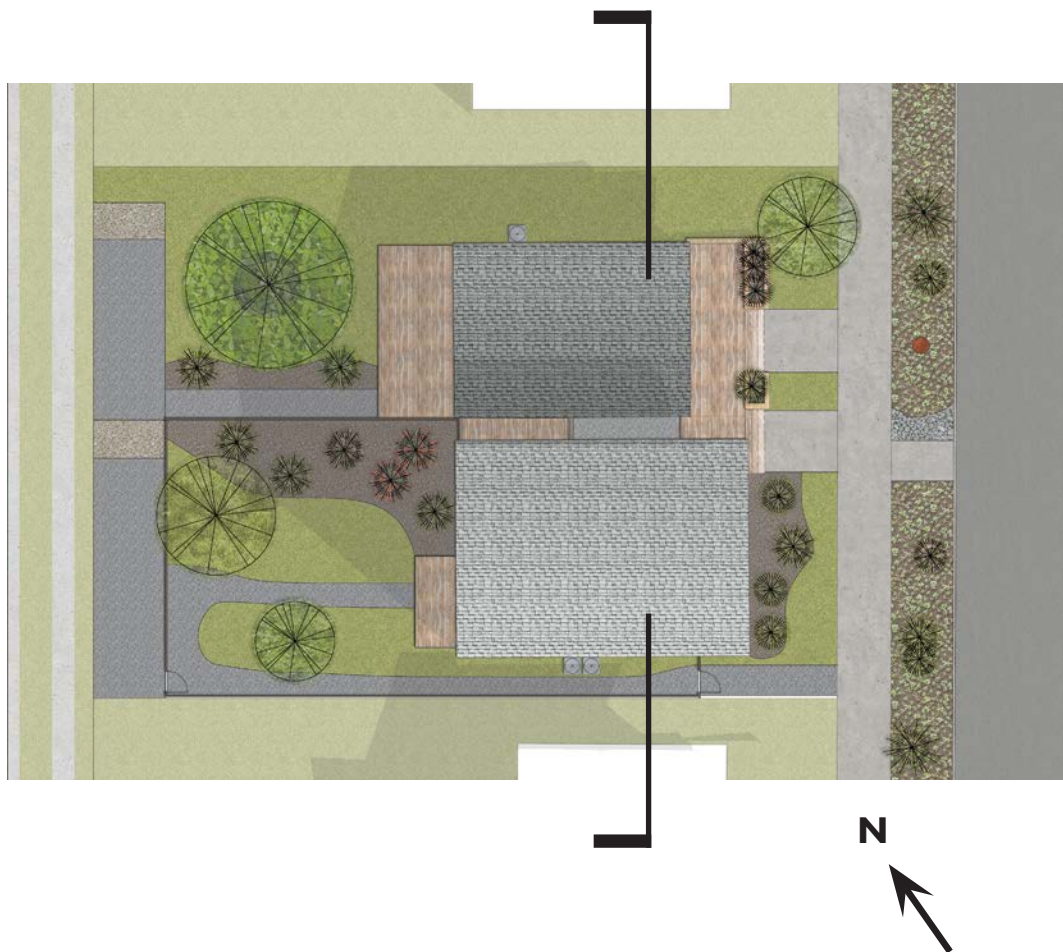
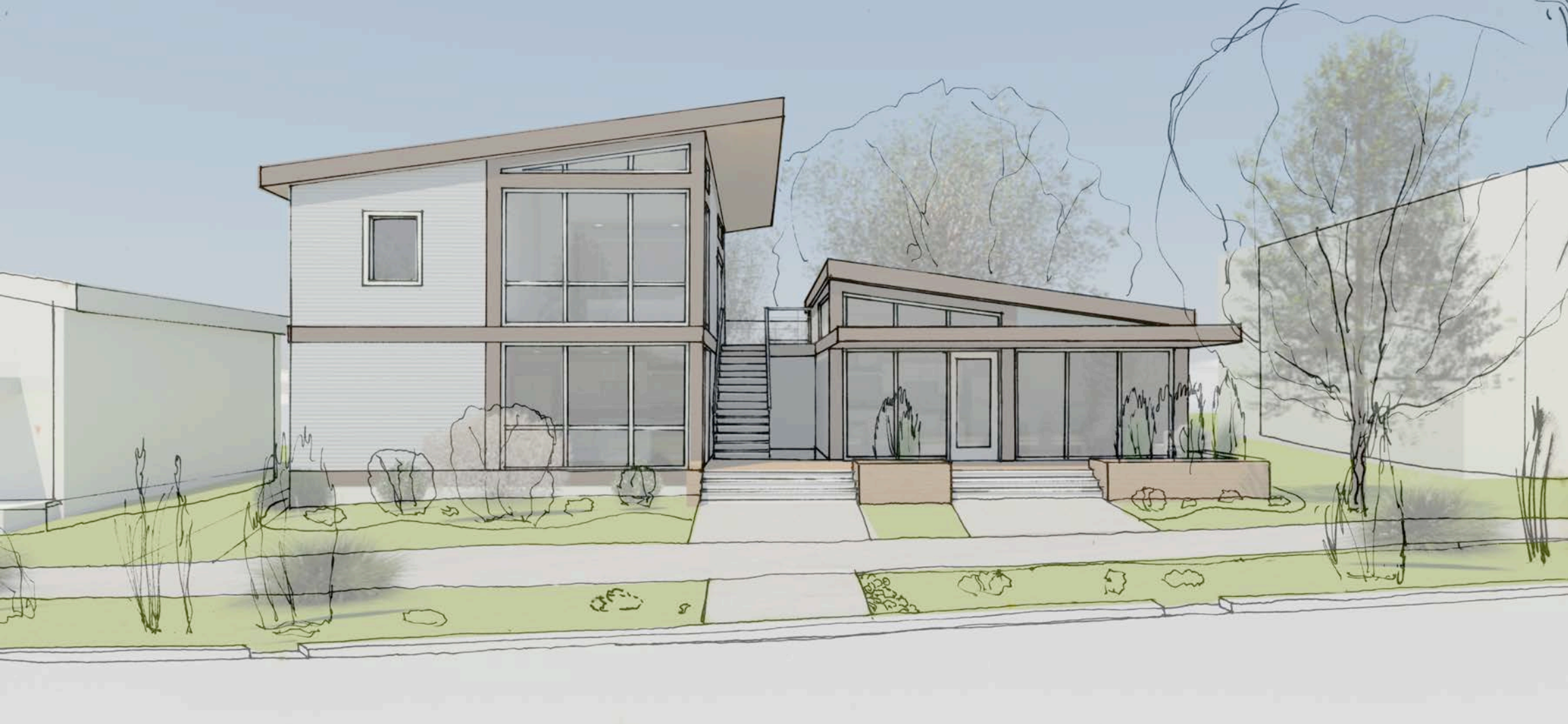
**2nd Floor Future Plan**



**1st Floor Future Plan**



These diagrams imagine a scenario where the current owners eventually expand to take the floor above by capturing the exterior stair and reconfiguring the stick built walls upstairs to add bedrooms.



This structure makes the most of the outdoor spaces as an opportunity to connect to the neighborhood as a whole or on a more private individual scale.

The modularity of the program fits neatly with the use of panelized construction material. In this building, the main structure, roof and floors are built with structural insulated panels, clad in finishes typical to residential construction. This form of building is not only efficient in energy cost but construction time as well. The use of the insulated panels also helps with privacy concerns at demising wall locations for multiple family living. By extending the height of the second floor unit with the slope of the roof, all units have access to both direct and ambient natural light. The resultant massing is one which accommodates 3 separate residents in a single building without being overly imposing in scale to the surrounding environment or looking like a boiler plate garden style apartment.



Section Axon



**Single Story Apartment**

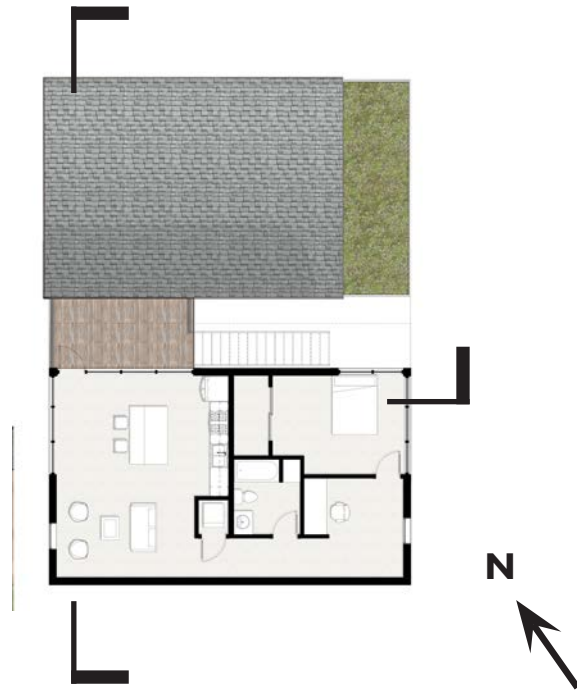


**Upstairs Looking Out**

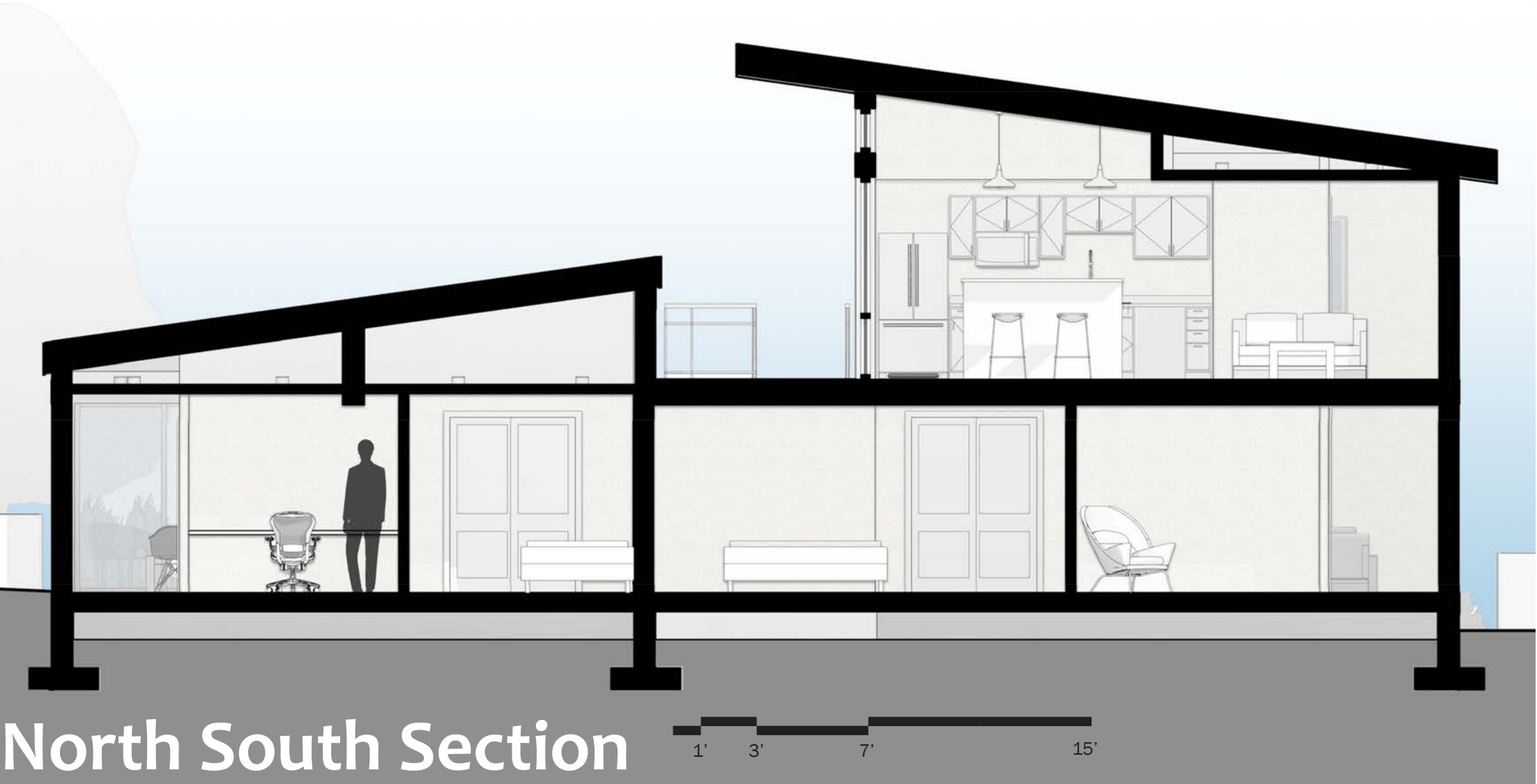
**Exterior From North**



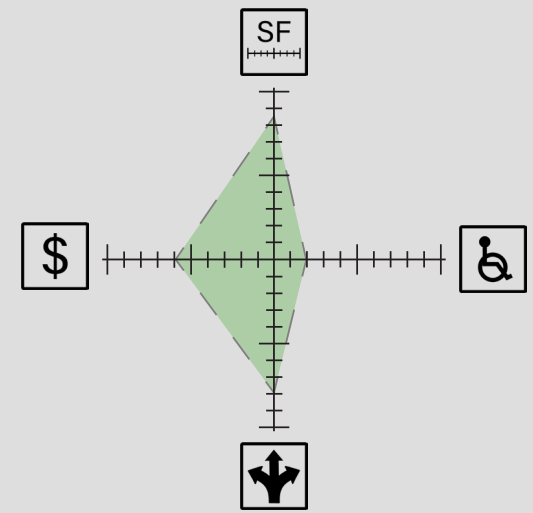
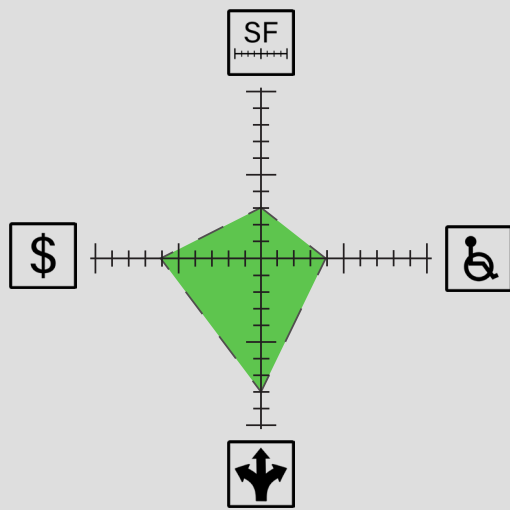
**Exterior From South**



What this shared living environment represents is the nature of change in the needs of residents and how residential architecture can address more than a single phase of family life. There are spatial needs for the transition periods in life and the small scale that those generally require can be located within the fabric of a broader and more diverse environment instead of a motel room or numbered door in an apartment tower corridor.

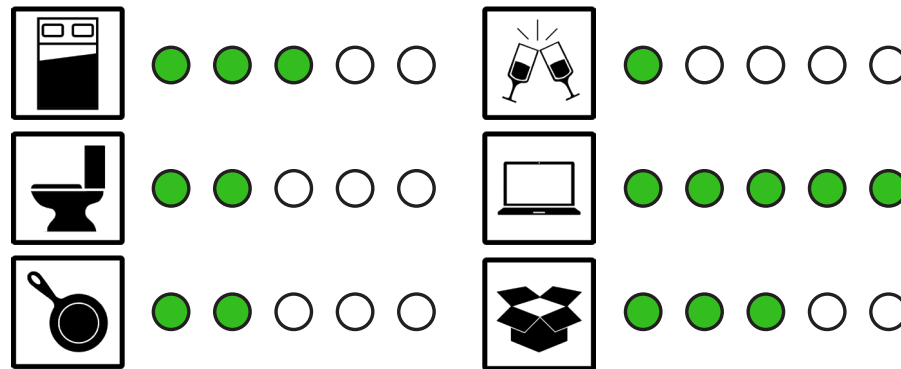


**North South Section**



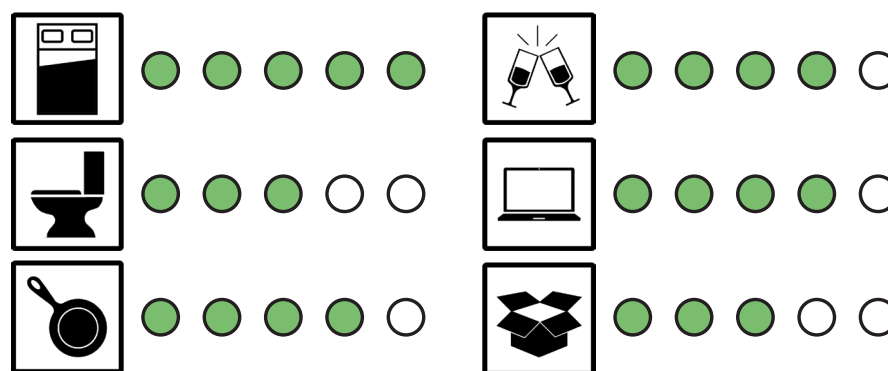
### Emily - 2 Story Semi-Attached

Since Emily's immediate family is small, she's able to dedicate the front of her house to her dog grooming business. However, there needs to be clear separation between her work and family life. She'd also like an enclosed yard for her young son and their own dog to play in.



### Jason and Elisabeth - 2 Story Semi-Attached

While Elisabeth can walk to work with their kids, Jason's programming job requires a private home office for days when he doesn't commute. All four are also big fans of games, both video and tabletop, and want open, flexible living spaces to accommodate and display their family hobby.



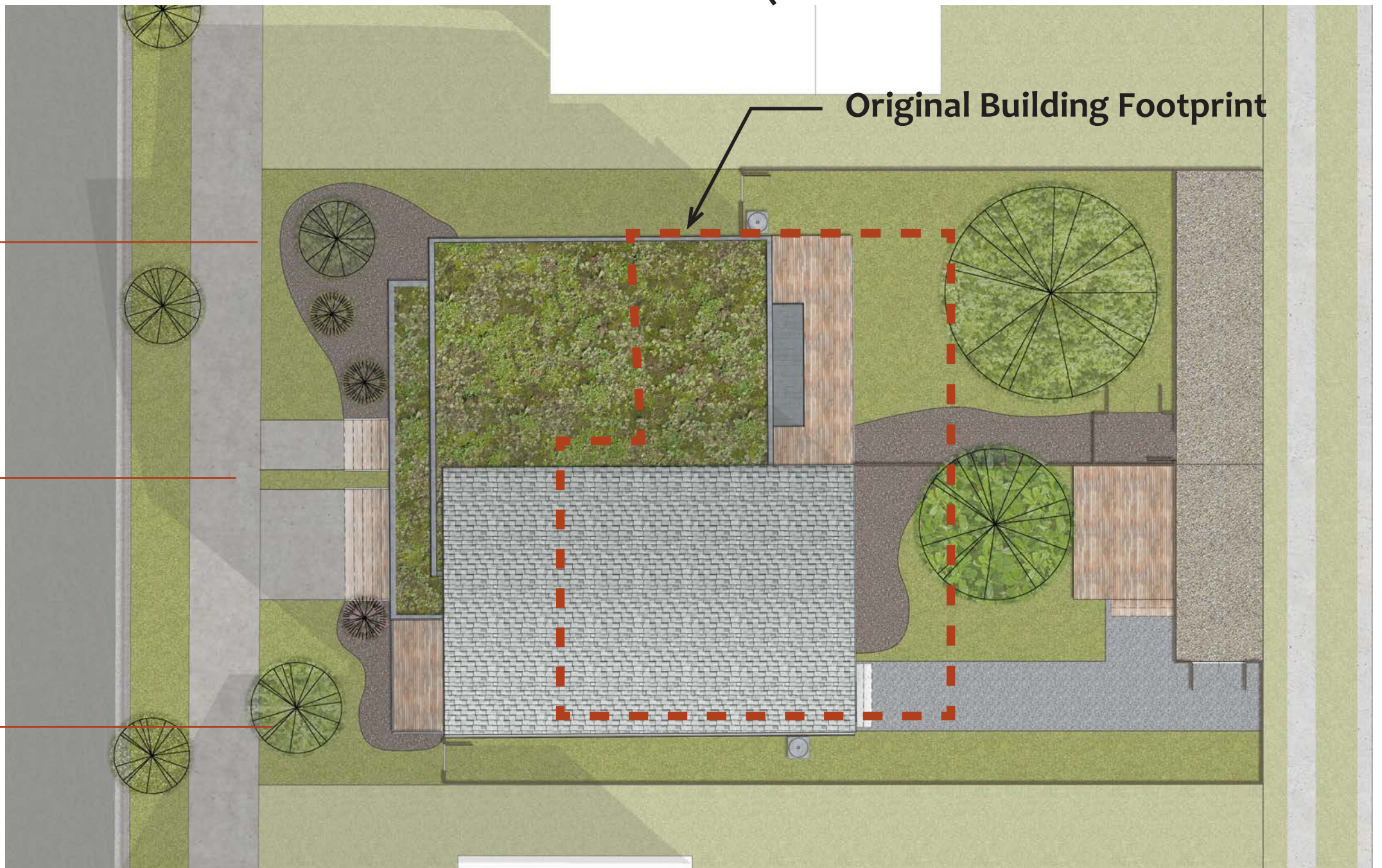


# 7 - Family Business

In contrast to the type of family the suburbs were based on and marketed to, today the whole family works, and in diverse ways. The increased spatial needs and functional concerns may be similar between then and now but the overall relationships have changed and so too do the forms.

Here, the nuclear family expands beyond the single atom to include two more inhabitants- Elisabeth and her sister Emily have chosen to divide a property to create a semi-detached 2 family home on what used to be a single lot. This allows for Elisabeth to more reasonably afford a home near the school where she works while still giving her husband Jason and their two children the space a family of 4 needs. For single mom Emily, being close to family is crucial, but the best part of this move for her is the light commercial uses allowed in the area. Combined with high foot traffic on her new street, this is the perfect place for her to start her in-home dog grooming business.

## Site Plan





### Plan Legend

- 1. Entertainment room
- 2. Office
- 3. Guest/Rental Bedroom
- 4. Bathroom
- 5. Living Room
- 6. Kitchen/Dining
- 7. Washroom
- 8. Dog Grooming
- 9. Bedroom
- 10. Storage/Utility





## 2nd Floor Plan

The family of 4 organizes the program of their space vertically. Public and entertainment functions comprise the first floor with a soft division between living room style spaces and those for eating. Private functions are located upstairs but maintain a visual and aural connection at the double height space. This is the first unit to take advantage of a basement where the office of a computer programmer and an expansive digital entertainment system are best suited. The remaining space is converted to a guest room with separate access to outside.

Emily's house is arranged similarly with the exception of the storefront given to her dog grooming business for client visibility. Like the previous examples, the density and setbacks for the lots mean light is best brought in at the fronts and backs. Since that front exposure is given to the business function, the back incorporates a double height space with full glazing to make up for the natural frontage lost on the opposite side. Utility functions are primarily backed up against the demising wall for simplicity of plumbing.



This semi-attached dwelling makes the most of the new zoning opportunities by incorporating a home based business space along with a residential program. The adjacencies of the half bath and kitchen also open up the possibilities for this business to evolve with time, or a new inhabitant.

The structure takes a material common to current residential design but utilized in a modern way. Cross Laminated Timber allows for larger unsupported spans in a wooden building and creates the primary shell, demising wall, and floors. The material also allows for both a pitched southern exposure roof shed and flat northern roof to better bring light in to the upper floor rooms without significantly increasing building massing. This wrapped super-structure provides an opportunity for large sections of glazing set within the shell to bring in natural light and allow views out, especially for the storefront system where business visibility is important. The interactions of planes of the front facade show that while there are two units in the structure with distinct characters, they both belong of the same family.



Section Axon

**Main Unit Living Room**

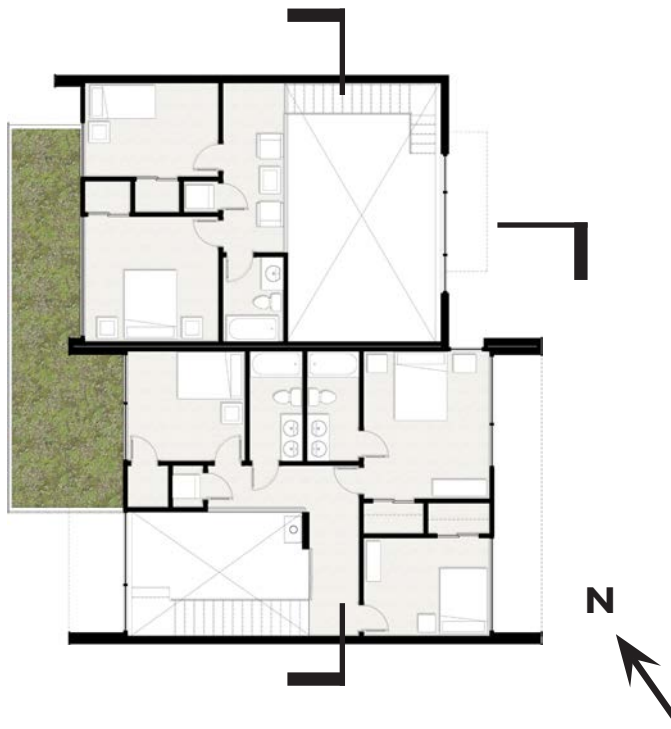


**From Dog Grooming**



# Exterior From South







While they are not the only or even primary demographic who can benefit from housing in suburban neighborhoods, the single family still has a place within its fabric. The building here serves as an example that a single family home can be built for more than a single family without sacrificing the space or program. It breaks the notion that a home is unable to serve as a place of work or commerce. Instead a neighborhood can not only support such functions without losing its character, but even be enriched by their presence.



East West Section

# Bibliography and Image Credits

- Howard, Ebenezer. Garden Cities of To-Morrow, Etc. London, 1902. from <https://www.gutenberg.org/ebooks/46134>
- Hayden, Dolores. 2004. Building suburbia: green fields and urban growth, 1820-2000. New York: Vintage Books.
- Berger, Alan, Joel Kotkin, and Celina Balderas-Guzmán. 2017. Infinite Suburbia. New York: Princeton Architectural Press.
- Leyden, Kevin M. 2003. "Social Capital and the Built Environment: The Importance of Walkable Neighborhoods." American Journal of Public Health 93 (9): 1546–51. doi:10.2105/AJPH.93.9.1546.
- Hayden, Dolores, and Jim Wark. 2004. A field guide to sprawl. New York: W.W. Norton.
- Koolhaas, Rem, James Westcott, Ben Davis, Tom Avermaete, and Rebecca Bego. 2014. Elements.

Maps and housing data were compiled from Alexandria GIS Library and Census data

<https://www.alexandriava.gov/GIS>

<https://www.alexandriava.gov/planning/statistics/default.aspx?id=93628>

*Photographs and images credits as cited below the image, all other photographs and images are property of the author.*