

Syracuse University

## SURFACE at Syracuse University

---

Architecture Senior Theses

School of Architecture Dissertations and  
Theses

---

Spring 5-2023

### White Picket Possibilities: Socially, Economically and Environmentally Reshaping Suburbia

Brendan Carroll

Follow this and additional works at: [https://surface.syr.edu/architecture\\_theses](https://surface.syr.edu/architecture_theses)



Part of the [Architectural Technology Commons](#), [Environmental Design Commons](#), and the [Urban, Community and Regional Planning Commons](#)

---

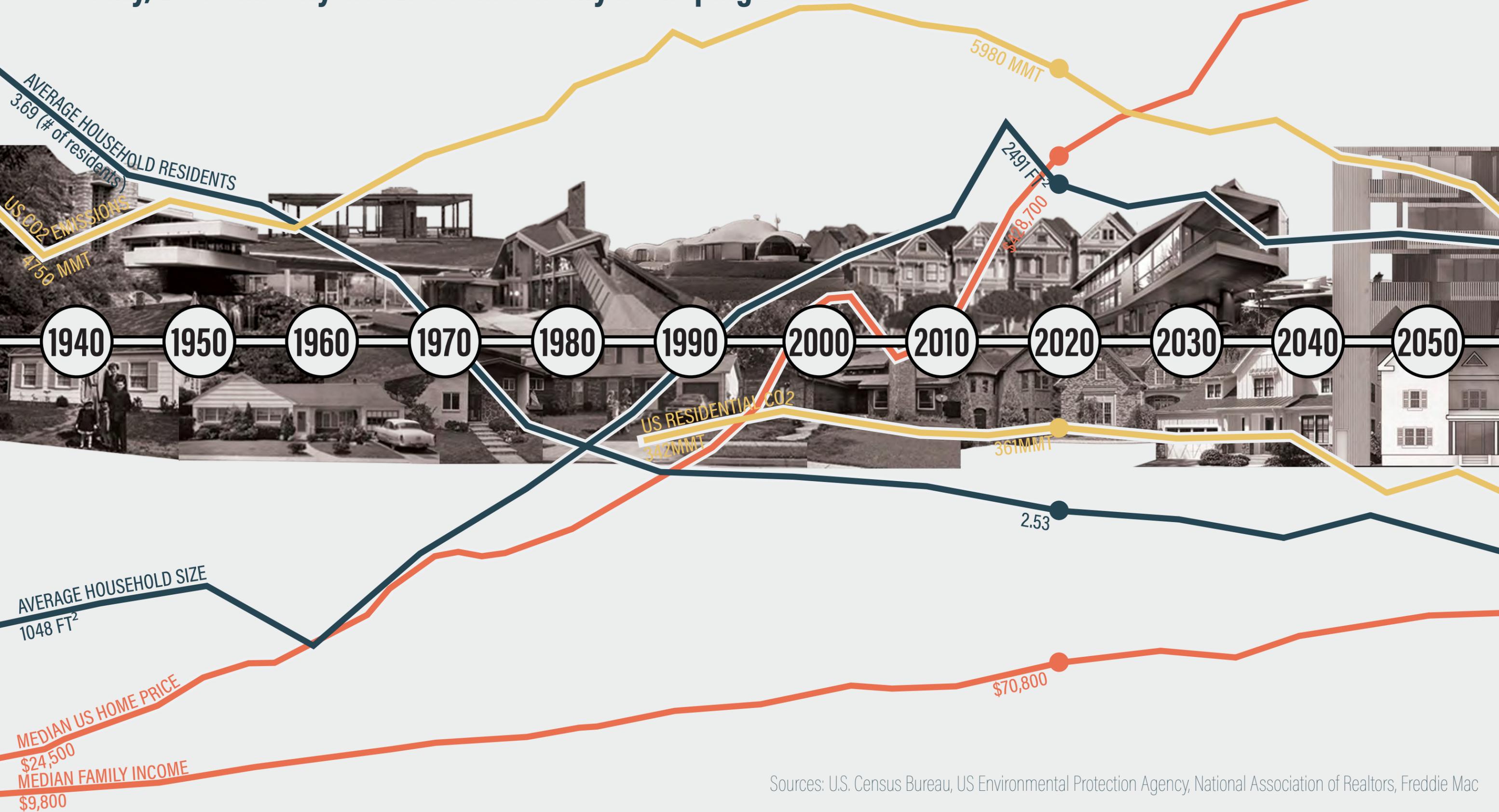
#### Recommended Citation

Carroll, Brendan, "White Picket Possibilities: Socially, Economically and Environmentally Reshaping Suburbia" (2023). *Architecture Senior Theses*. 539.  
[https://surface.syr.edu/architecture\\_theses/539](https://surface.syr.edu/architecture_theses/539)

This Thesis, Senior is brought to you for free and open access by the School of Architecture Dissertations and Theses at SURFACE at Syracuse University. It has been accepted for inclusion in Architecture Senior Theses by an authorized administrator of SURFACE at Syracuse University. For more information, please contact [surface@syr.edu](mailto:surface@syr.edu).

# WHITE PICKET POSSIBILITIES

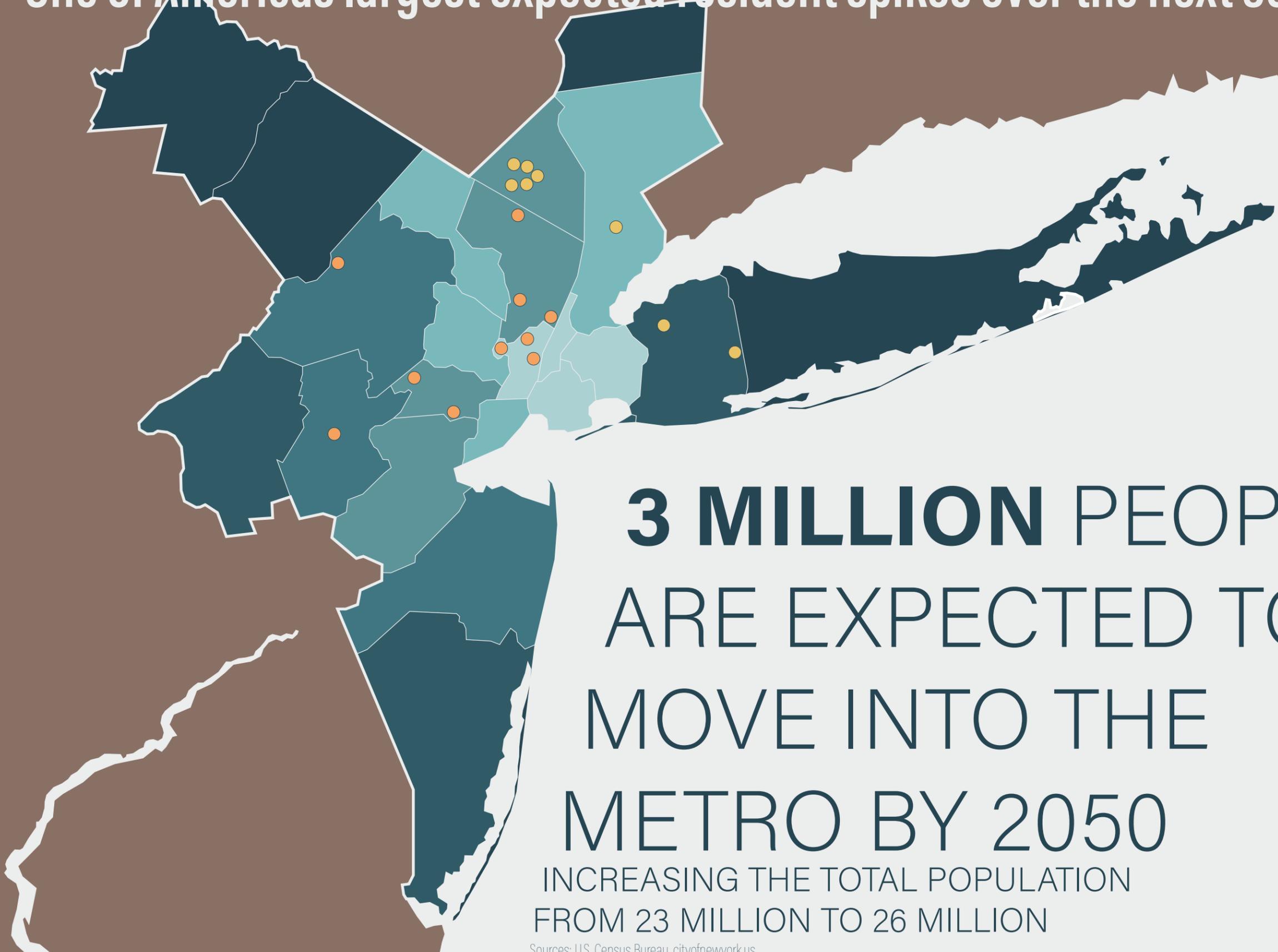
Socially, Economically and Environmentally Reshaping Suburbia



Sources: U.S. Census Bureau, US Environmental Protection Agency, National Association of Realtors, Freddie Mac

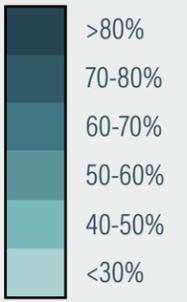
# NY METROPOLITAN AREA

One of Americas largest expected resident spikes over the next 30 years



**3 MILLION PEOPLE**  
ARE EXPECTED TO  
MOVE INTO THE  
METRO BY 2050

INCREASING THE TOTAL POPULATION  
FROM 23 MILLION TO 26 MILLION

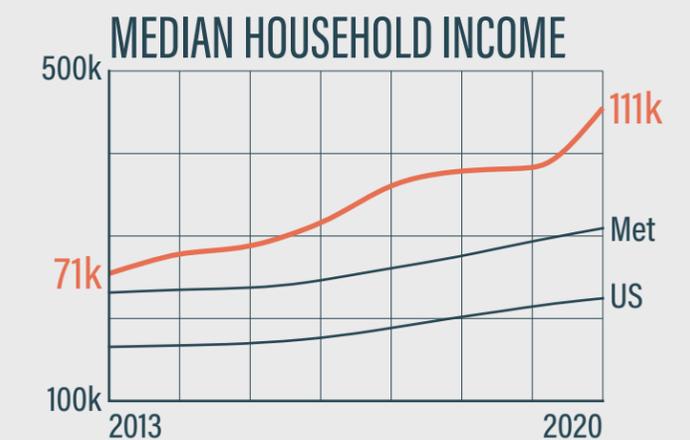
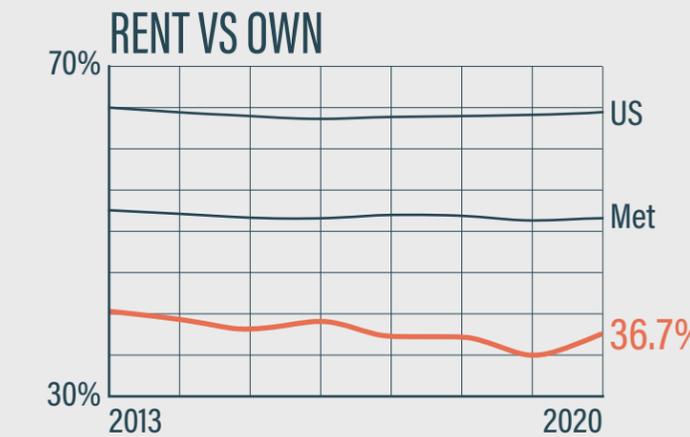
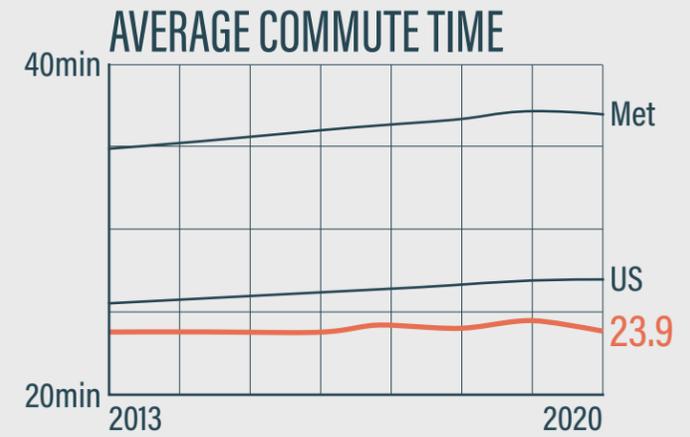
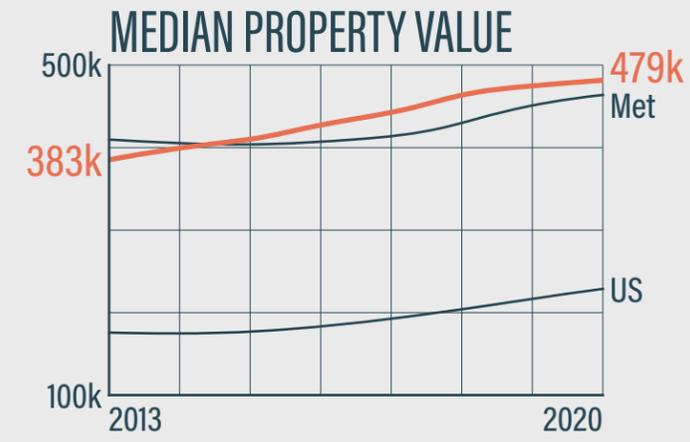
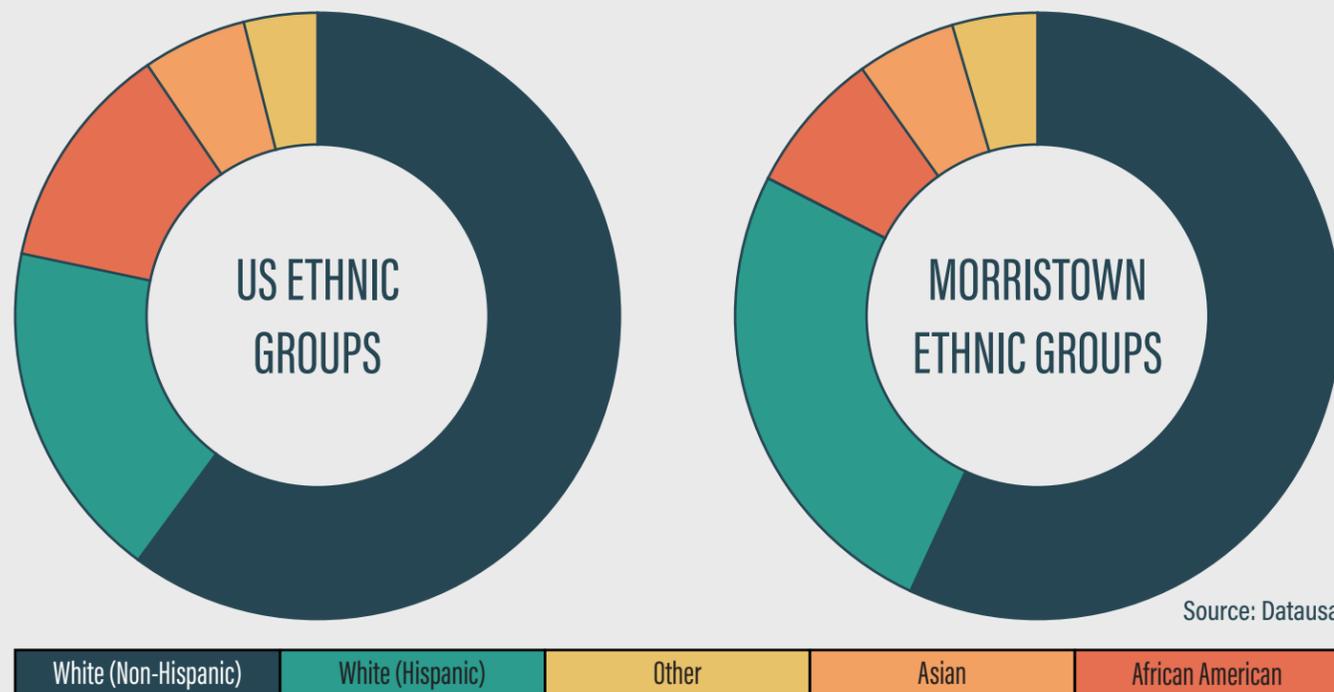
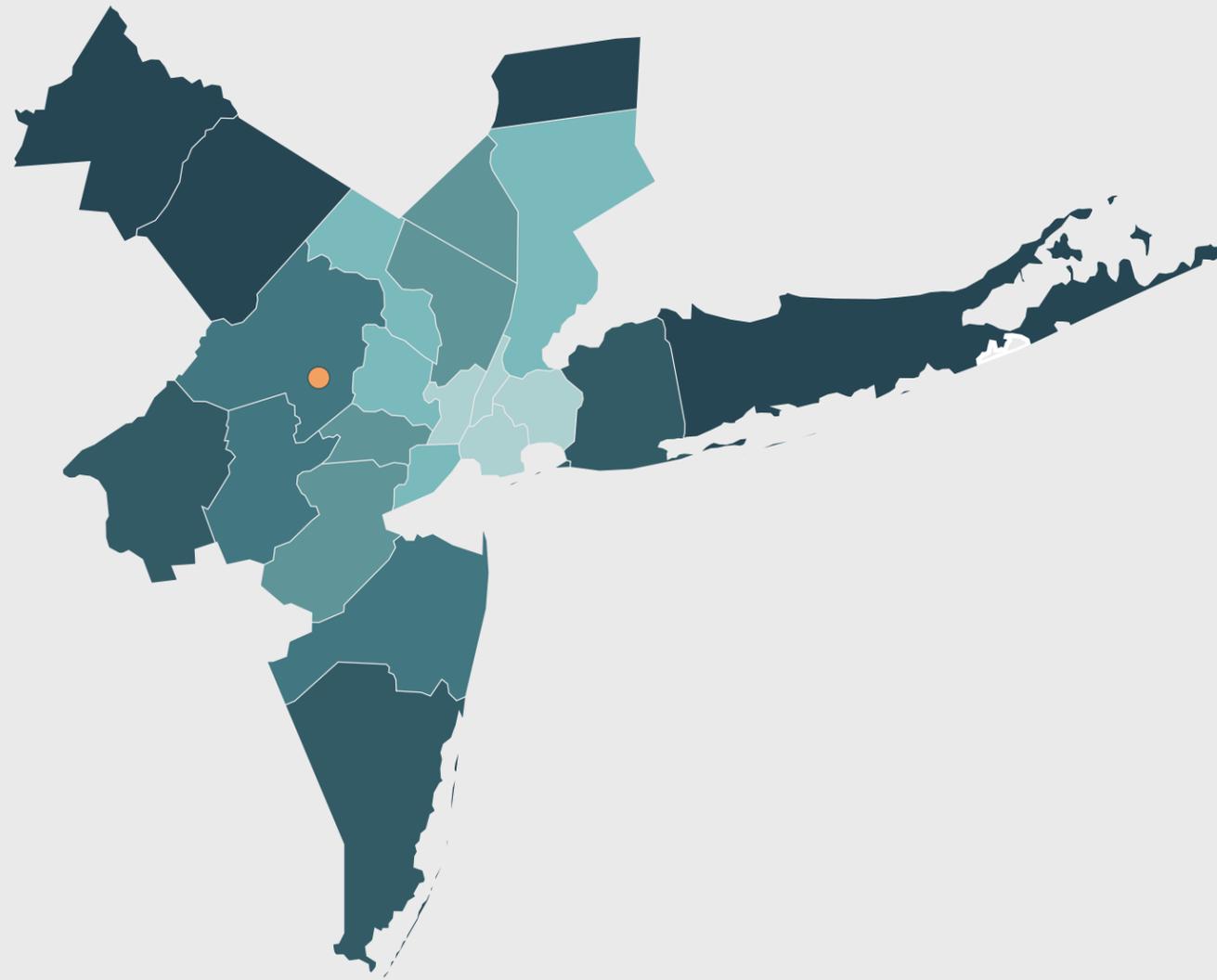


● Top 10 fastest growing city in NY  
● Top 10 fastest growing city in NJ

Sources: U.S. Census Bureau, cityofnewyork.us



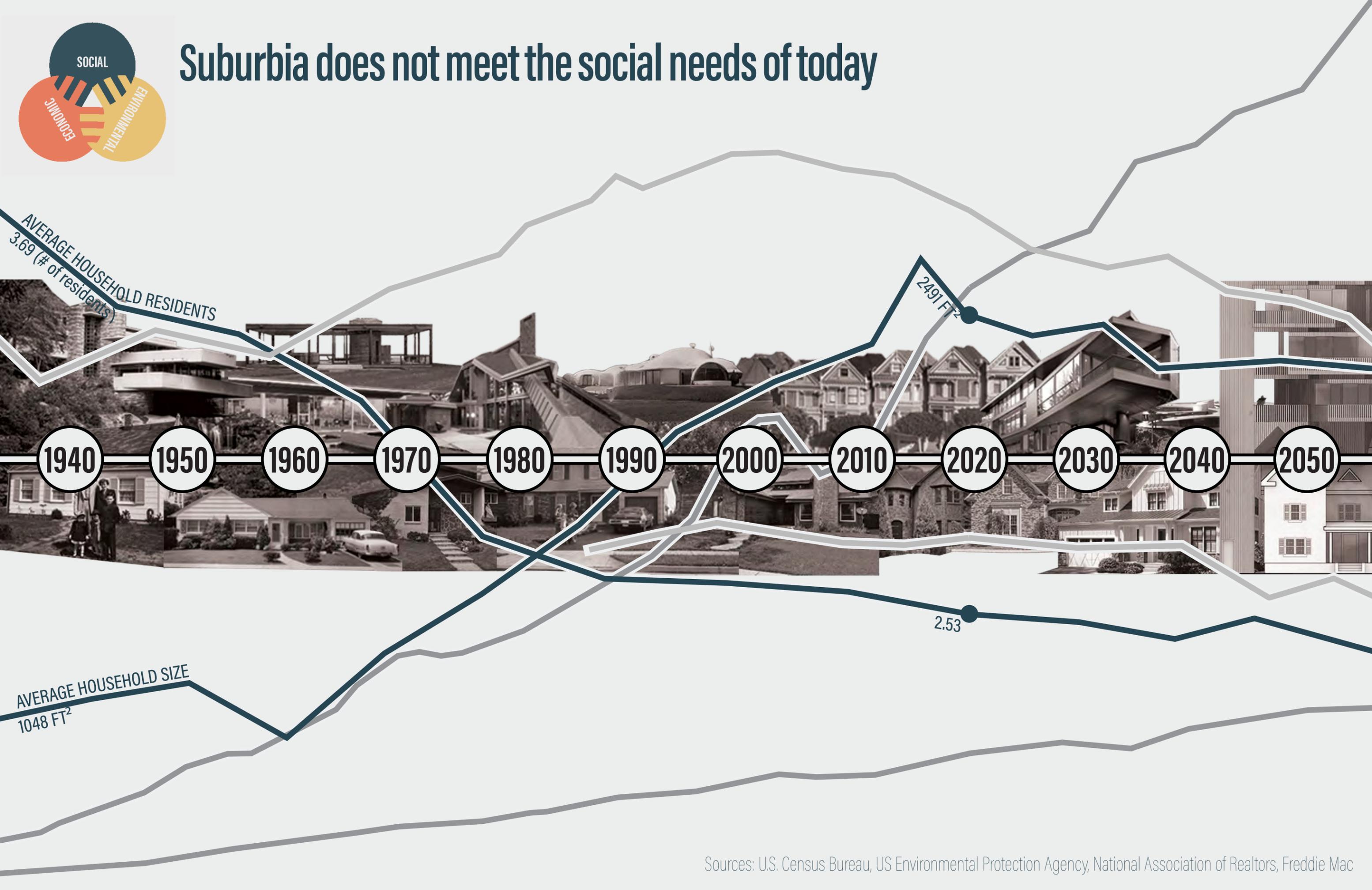
# MORRISTOWN NEW JERSEY







# Suburbia does not meet the social needs of today



# THE 1960 NUCLEAR FAMILY

Over 40% of families were the traditional nuclear family





# VARYING FAMILY NEEDS

## Every family has unique spacial needs which are not met by current homes

### SINGLE



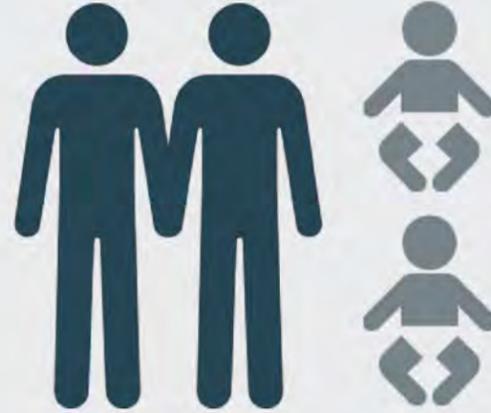
#### USE AS MULTI UNIT

- Investment property
- Resident of one half, rental income from the other

#### USE AS HOME

- Purchasing property for potential future family
- Desire to use the property as traditional single family home

### YOUNG COUPLE



#### USE AS MULTI UNIT

- Investment property
- Resident of one half, rental income from the other
- Second unit may be for family to visit or in law suite with new children
- Second unit could be nanny suite if desired

#### USE AS HOME

- Desire to grow family and may need additional bedrooms
- Desire to use the property as traditional single family home

### SINGLE PARENT



#### USE AS MULTI UNIT

- Investment property
- Resident of one half, rental income from the other
- Second unit may be for family to visit or in law suite to help with children

#### USE AS HOME

- May need additional bedrooms once children get older, or if the family grows in the future
- Desire to use the property as traditional single family home

### ELDERLY

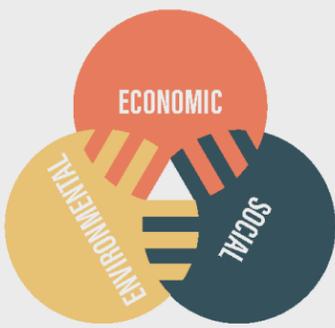


#### USE AS MULTI UNIT

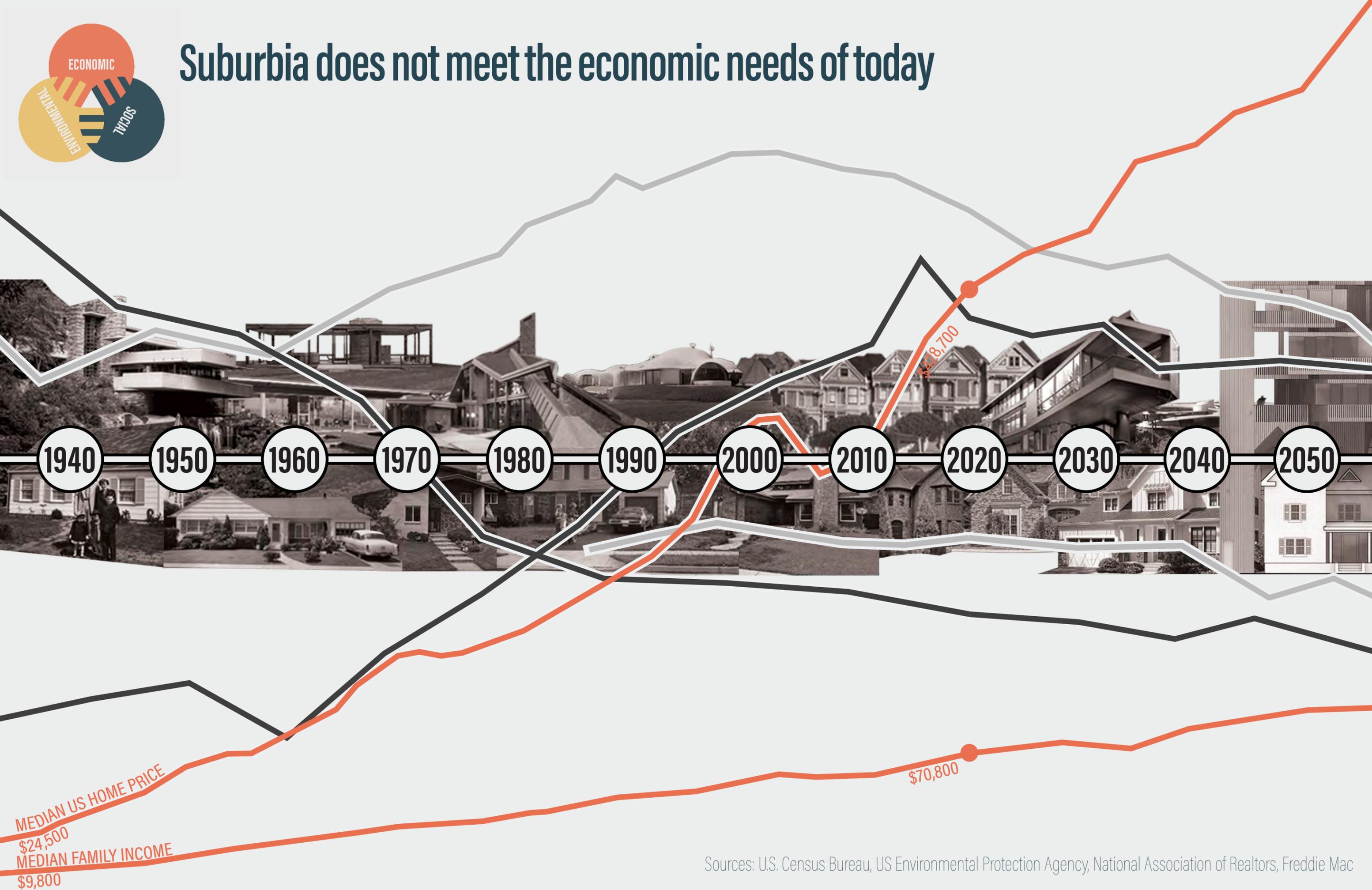
- Investment property
- Resident of one half, rental income from the other
- Second unit may be for family to visit or children who moved back home
- Live in nurse if needed

#### USE AS HOME

- Desire to use the property as traditional single family home up until the point they are not able to anymore



# Suburbia does not meet the economic needs of today

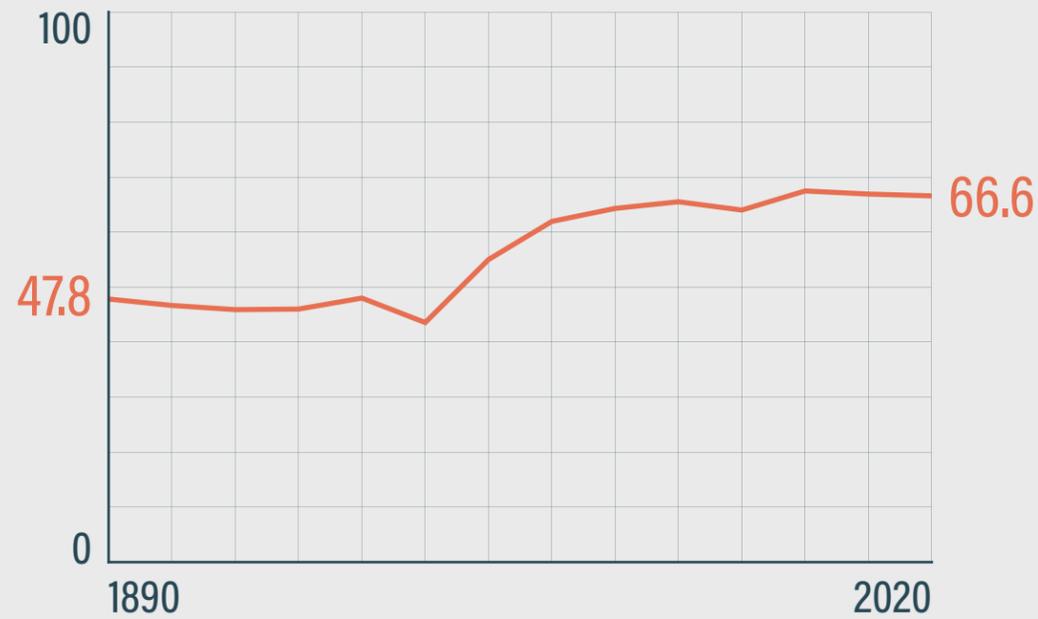


Sources: U.S. Census Bureau, US Environmental Protection Agency, National Association of Realtors, Freddie Mac

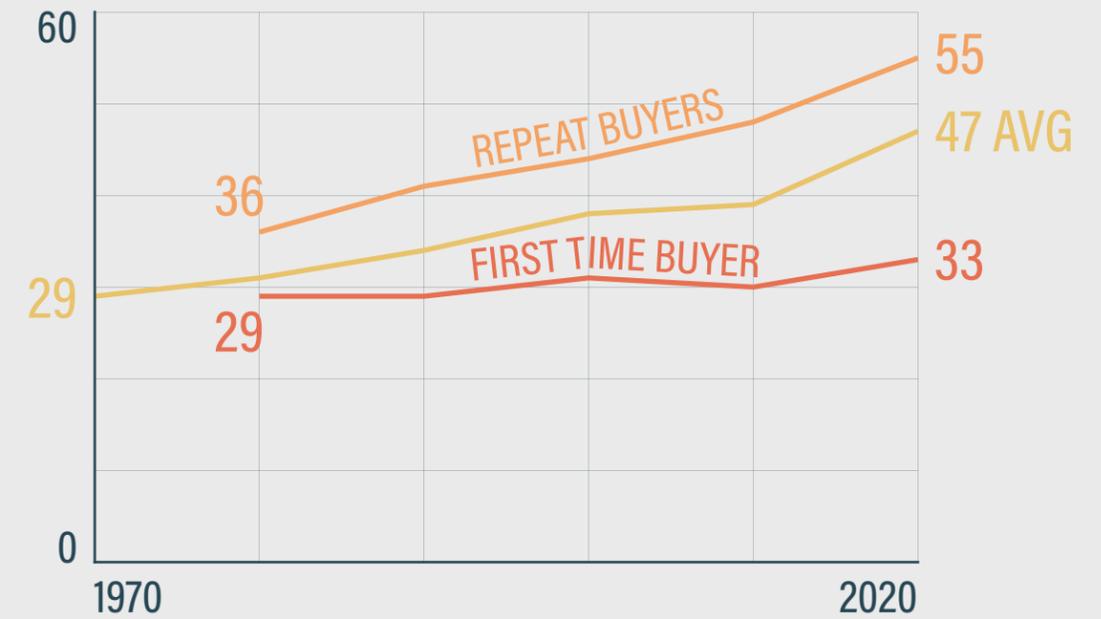
# ECONOMICS OF HOUSING

## The attainability of homes has decreased following the great recession which strengthened mortgage regulations

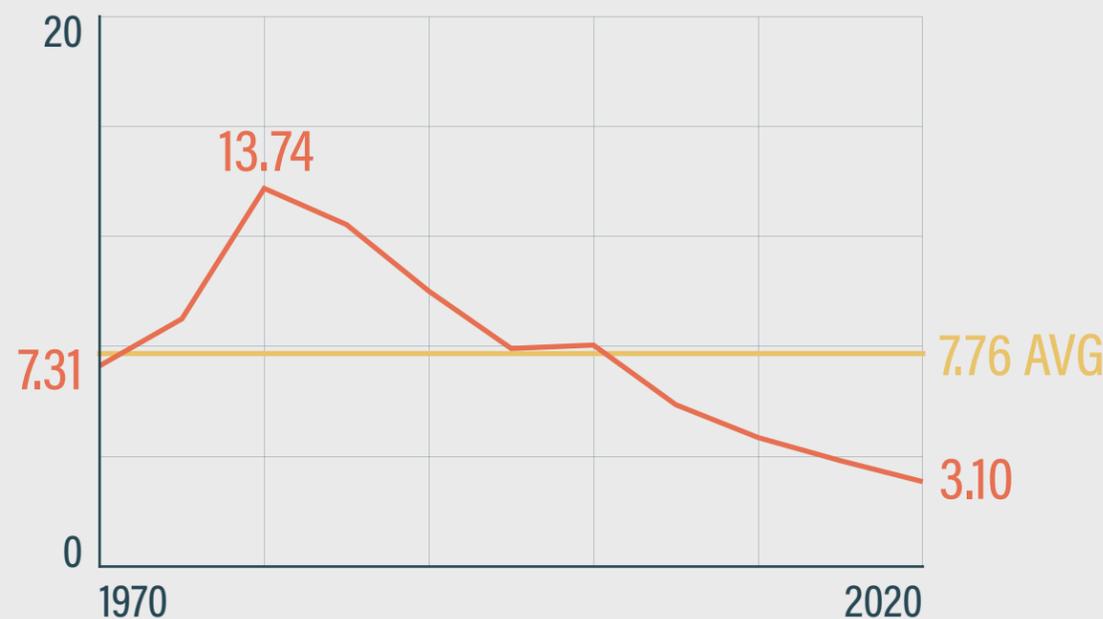
### HOME OWNERSHIP RATE



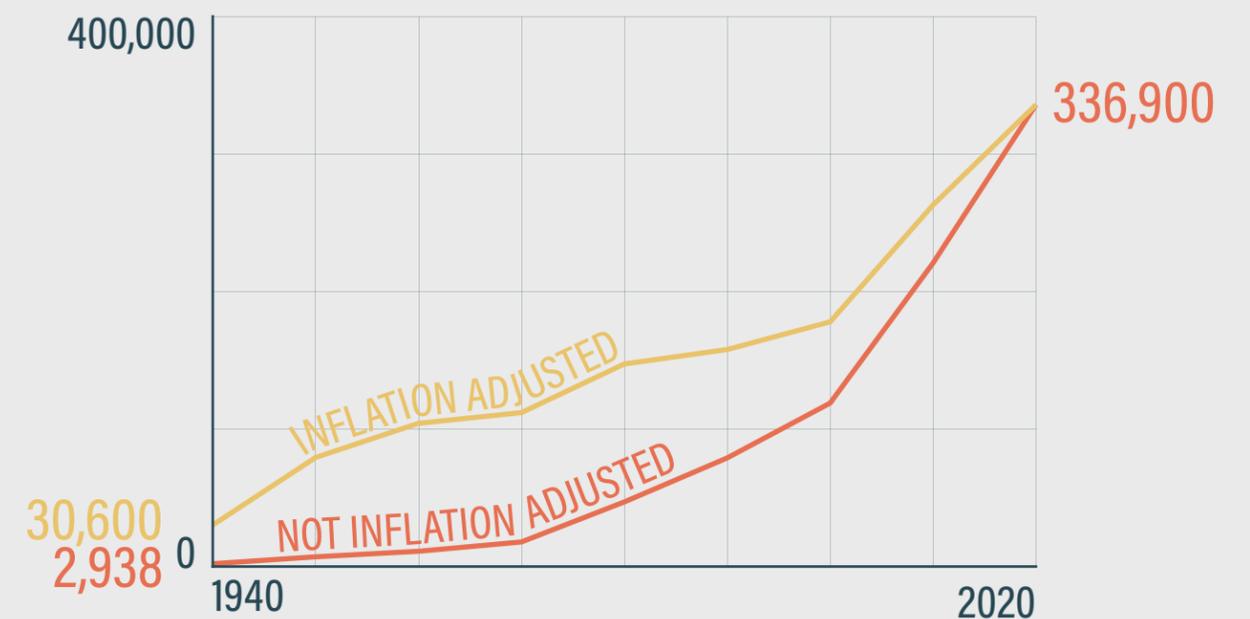
### AGE OF TYPICAL HOMEBUYER



### 30 YEAR FIXED RATE MORTGAGE RATE

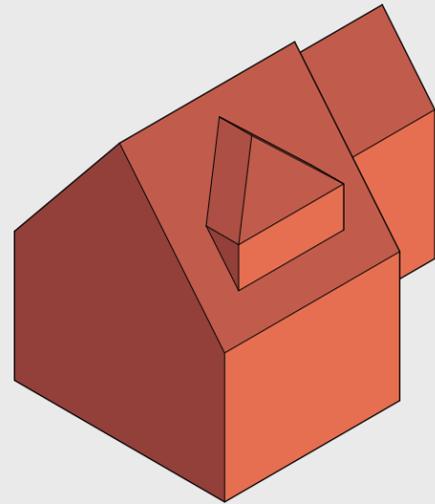


### AVERAGE HOME VALUE (USD)



# INFORMAL RENTAL TYPES

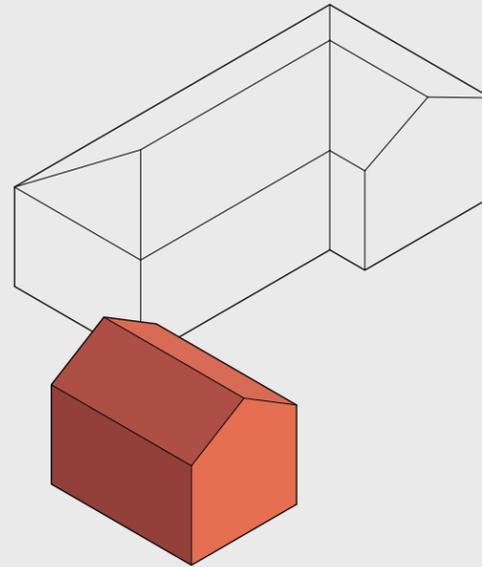
Various parts of homes are being rented to supplement income. Currently these units either come in conflict with residents or are entirely detached.



## Full Home Rental

5 Bed, 4 Bath

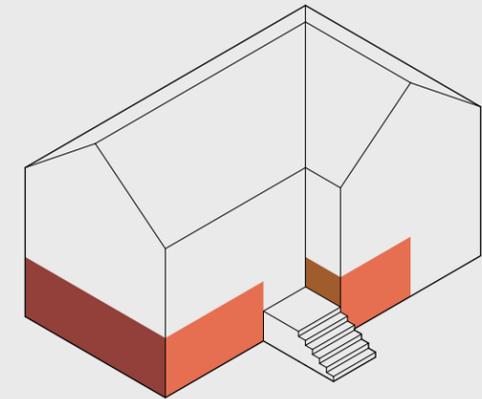
Home is owned by a couple without kids at home  
Property used entirely for profit



## Full Guesthouse

1 Bed, 1 Bath

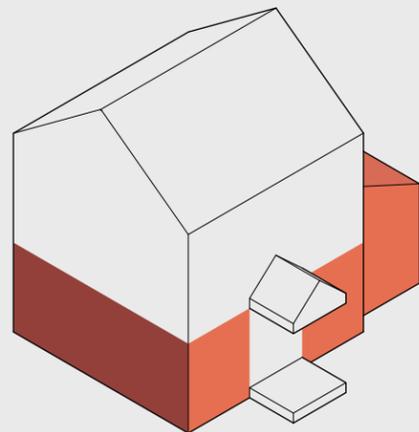
Home is owned by a couple without kids at home  
Renovated small dwelling to rent/supplement income



## Ground Floor Bedroom

1 Bed, 1.5 Bath

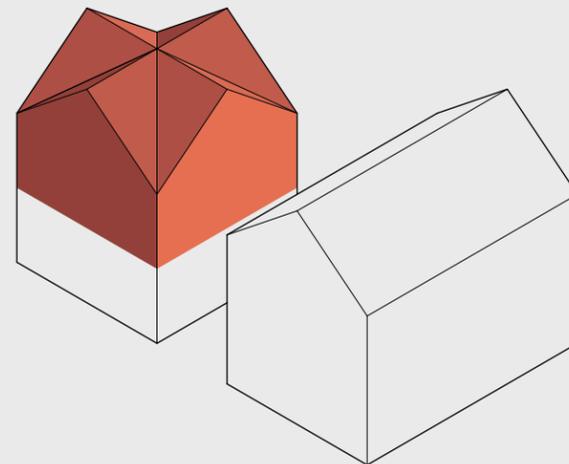
Home is owned by a couple without kids at home  
Rents out basement of home to help with expenses



## First Floor Separate Unit

1 Bed, 1 Bath

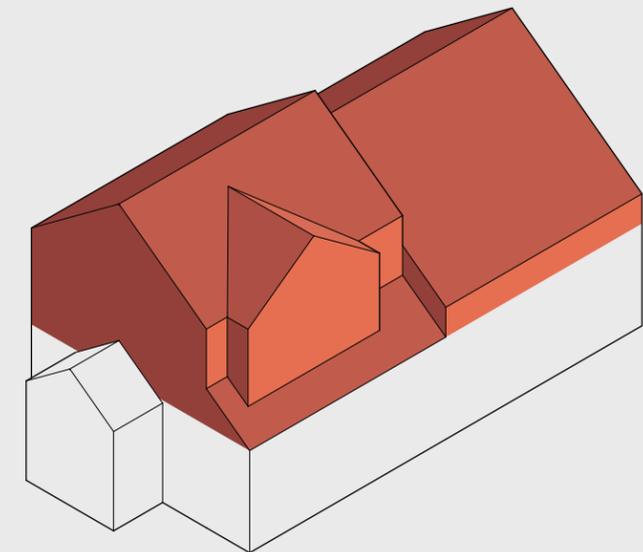
Home is owned by a couple without kids at home  
Full home rental property rent out second floor longterm



## Above Garage Carriage House

1 Bed, 1 Bath

Home is owned by a couple with children at home  
Added kitchen to dwelling above garage to rent for income



## Second Floor Rental

2 Bed, 1 Bath

Home is owned by a couple without kids at home  
Rents one or both second floor bedrooms to help with mortgage

# EXISTING RENOVATION

## New housing typologies have emerged to give homes a revenue stream



### ADVANTAGES

- Quicker than new construction
- Cheaper if already owns the home
- Less construction waste
- Keeps the character of a neighborhood in tact
- Increases population density of a neighborhood without significant construction

### DISADVANTAGES

- The process can be unexpectedly expensive damage is found during renovation
- Is a fairly permanent transformation
- Often leads to very awkward and inefficient floor plans due to previous design

# NEW CONSTRUCTION



### ADVANTAGES

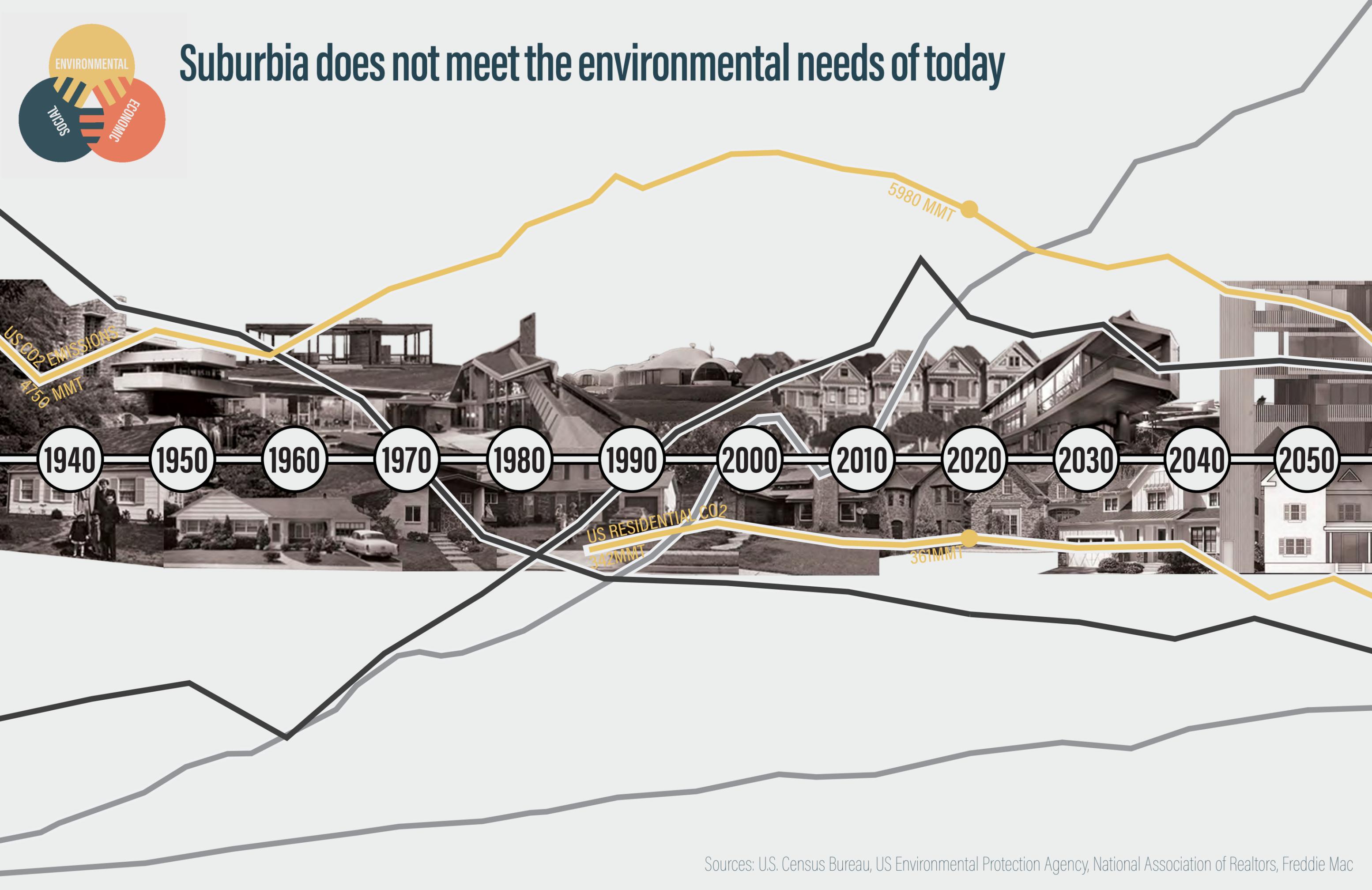
- Full design control
- Can design the home to be easily transformable from apartments to home
- Space can shift and be tailored to the need of the current residents
- Can be designed to have longer useful life than existing homes

### DISADVANTAGES

- More construction waste
- Either need to demolish existing home or build on currently unbuilt land
- Construction time is significantly longer

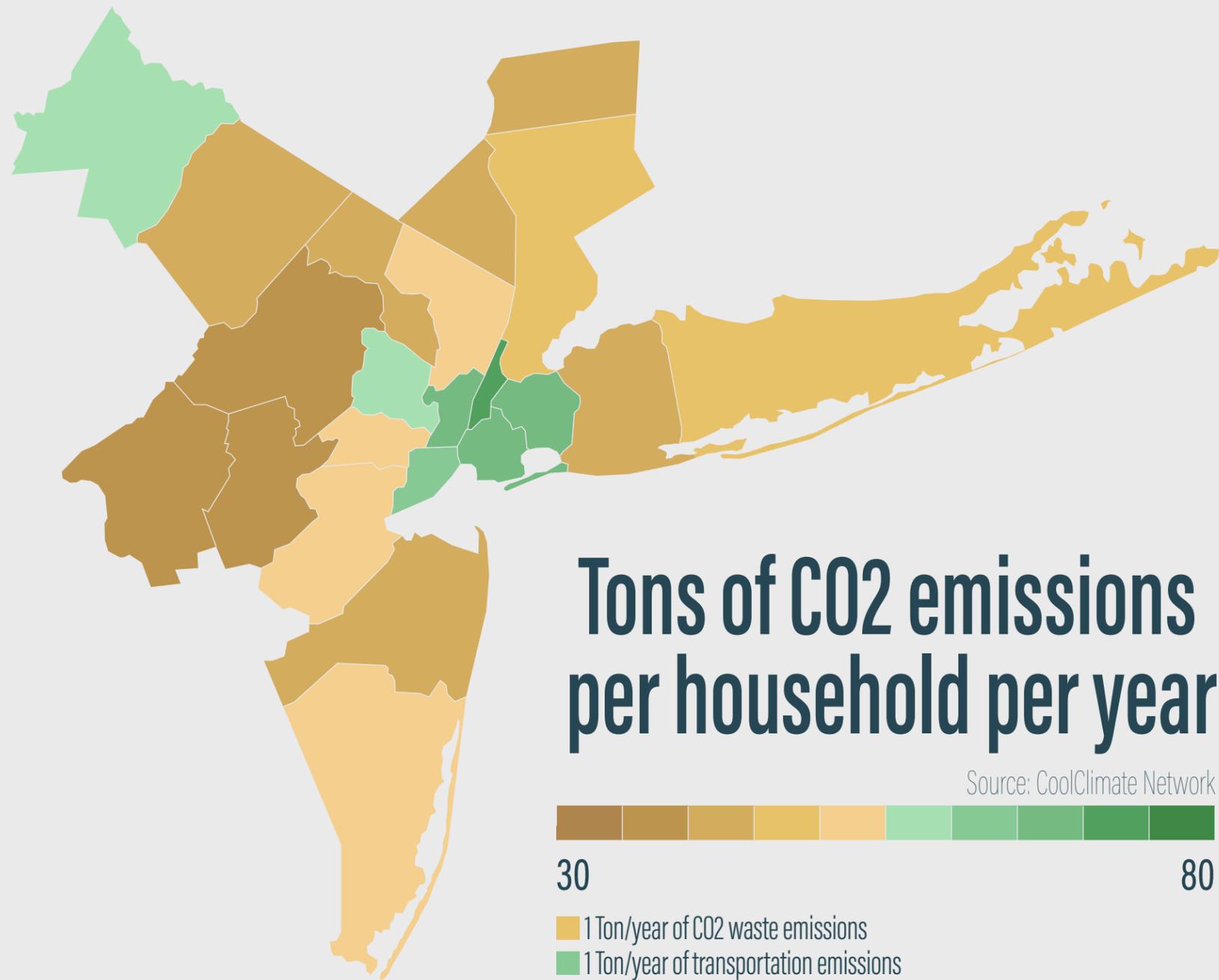


# Suburbia does not meet the environmental needs of today



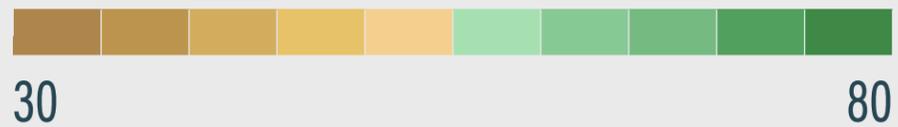
# SUBURB SUSTAINABILITY

“Population density exhibits a positive correlation with household carbon footprint” - Christopher Jones Ph.D in Energy and Resources Cal Berkeley

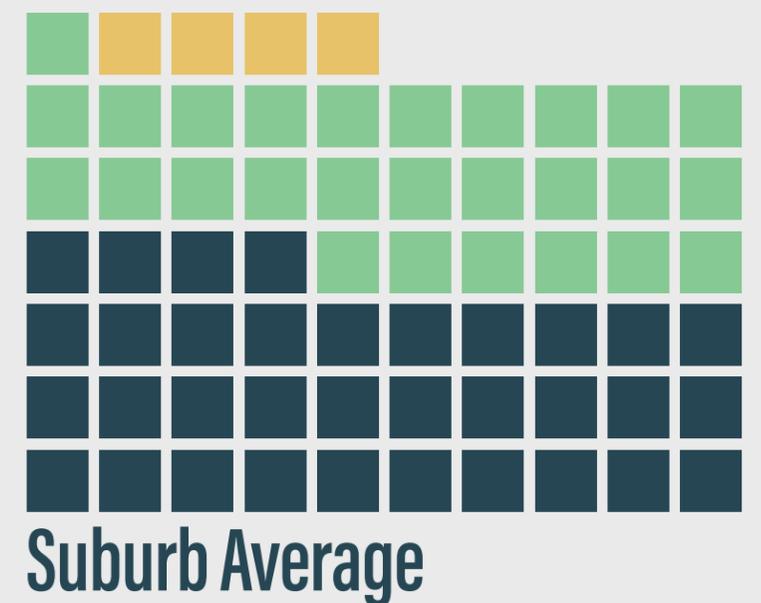
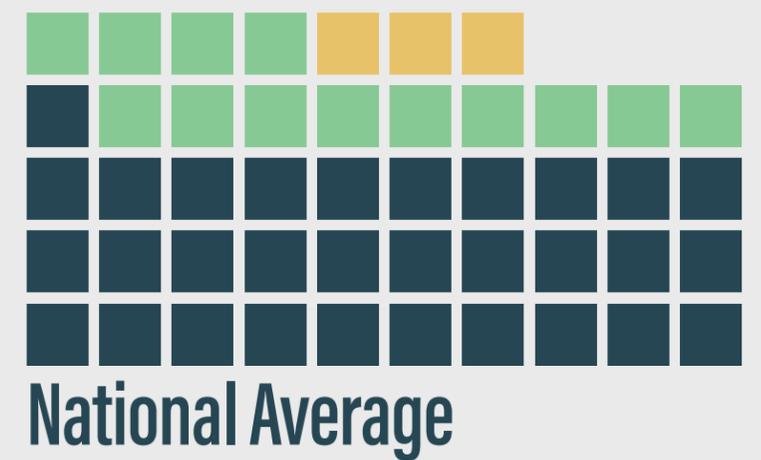
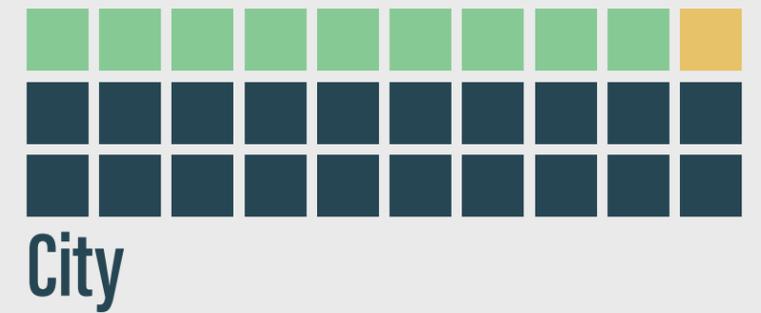


## Tons of CO2 emissions per household per year

Source: CoolClimate Network



- 1 Ton/year of CO2 waste emissions
- 1 Ton/year of transportation emissions
- 1 Ton/year of stationary energy emissions

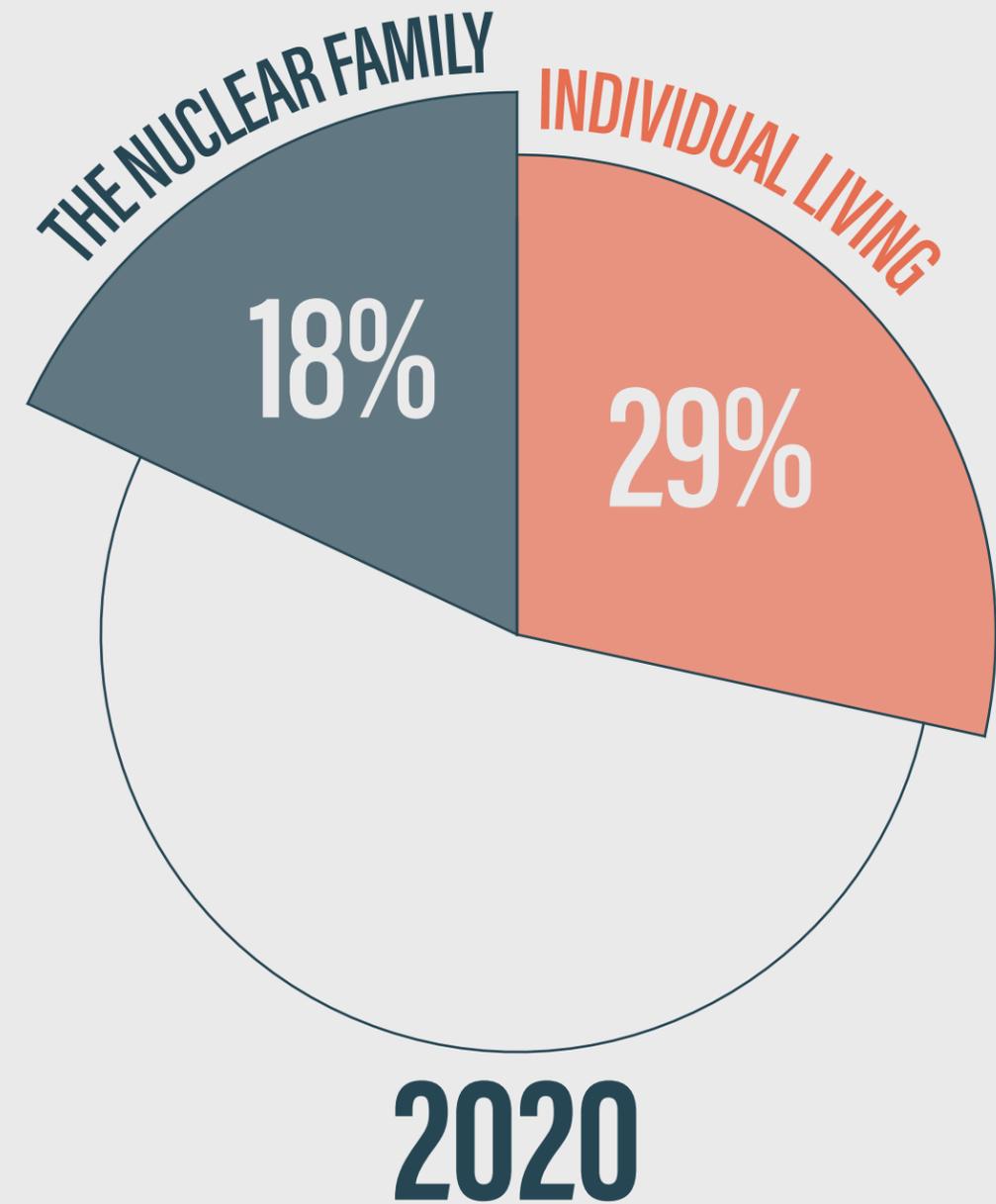
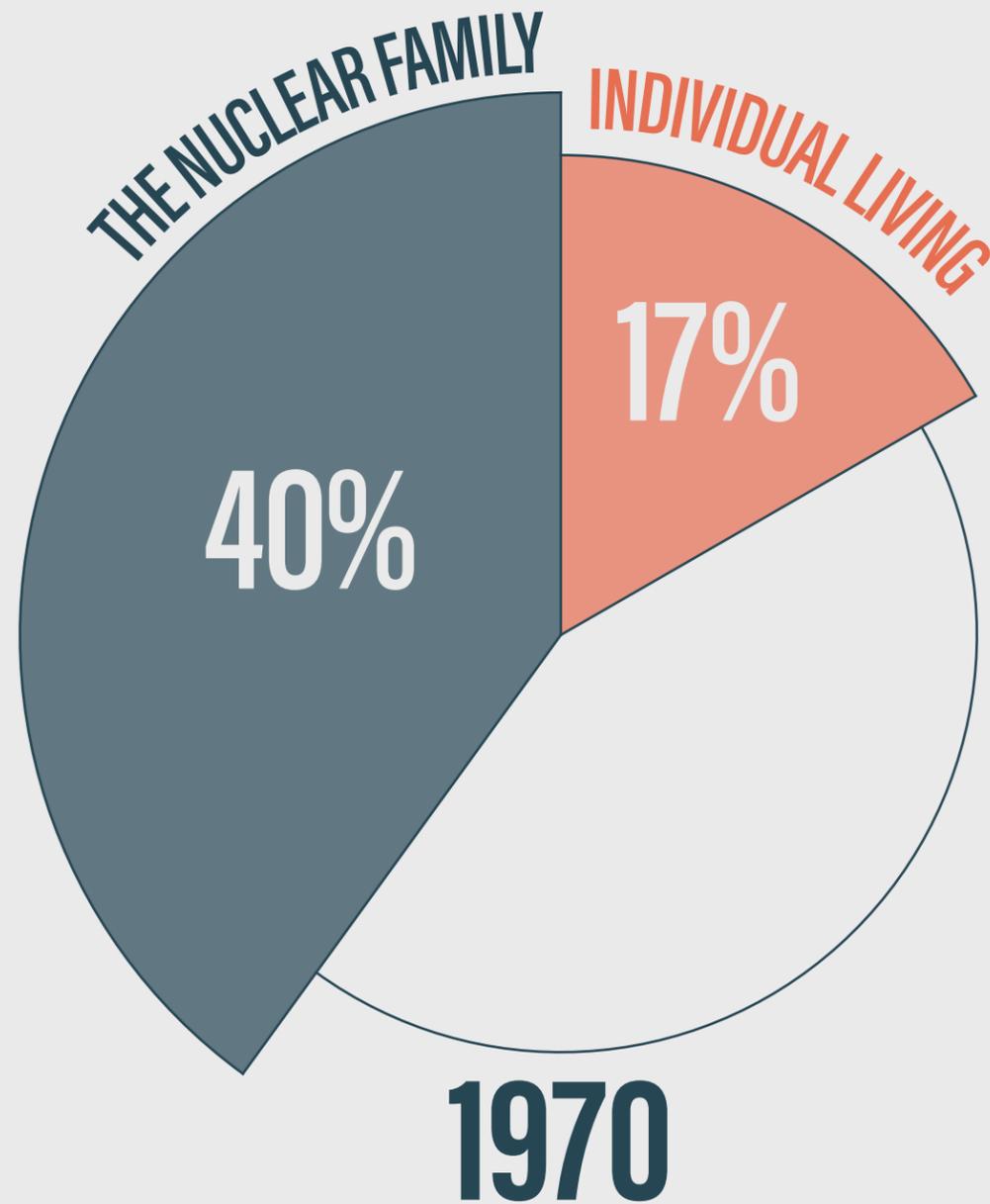


# Objectives

- Increase suburban density and decrease housing costs without building on currently unconstructed land or demolishing existing homes
- Implement additional housing while keeping the autonomy and privacy of all existing homeowners
- Create a housing option for individuals in suburbia which have been historically ignored within suburbia
- Address the shortfalls of suburbia and utilize the need for new construction as an opportunity to bring this aging housing typology into the 21st century

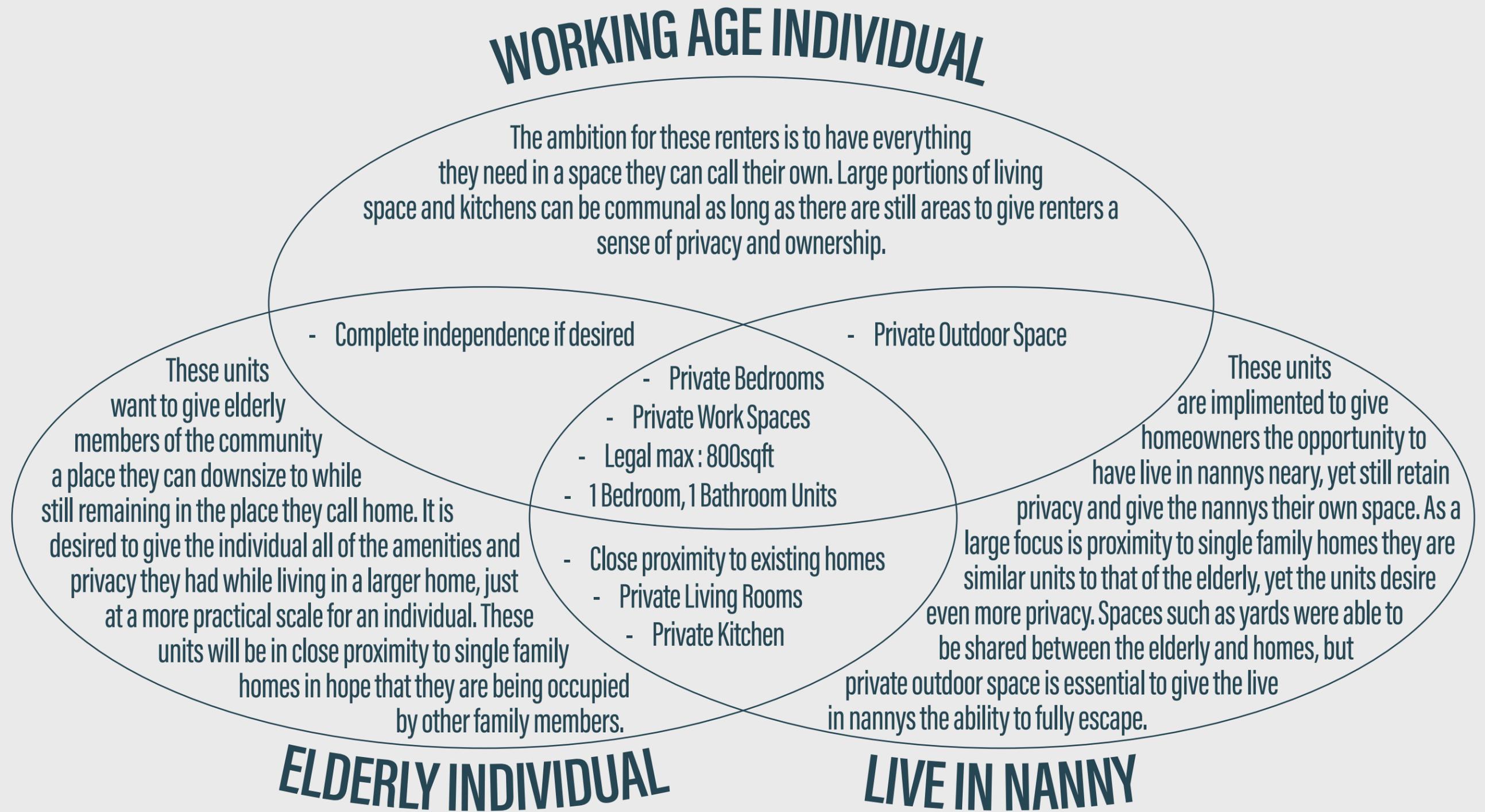
# HOUSEHOLD EVOLUTION

Living individually has become the most prominent household type passing the nuclear family which was the most prominent at the time of suburban rise.



# INDIVIDUAL LIVING TYPES

Even individuals that fall under the individual living categories have a wide range of needs on a case to case basis.



# ACCESSORY DWELLING UNIT

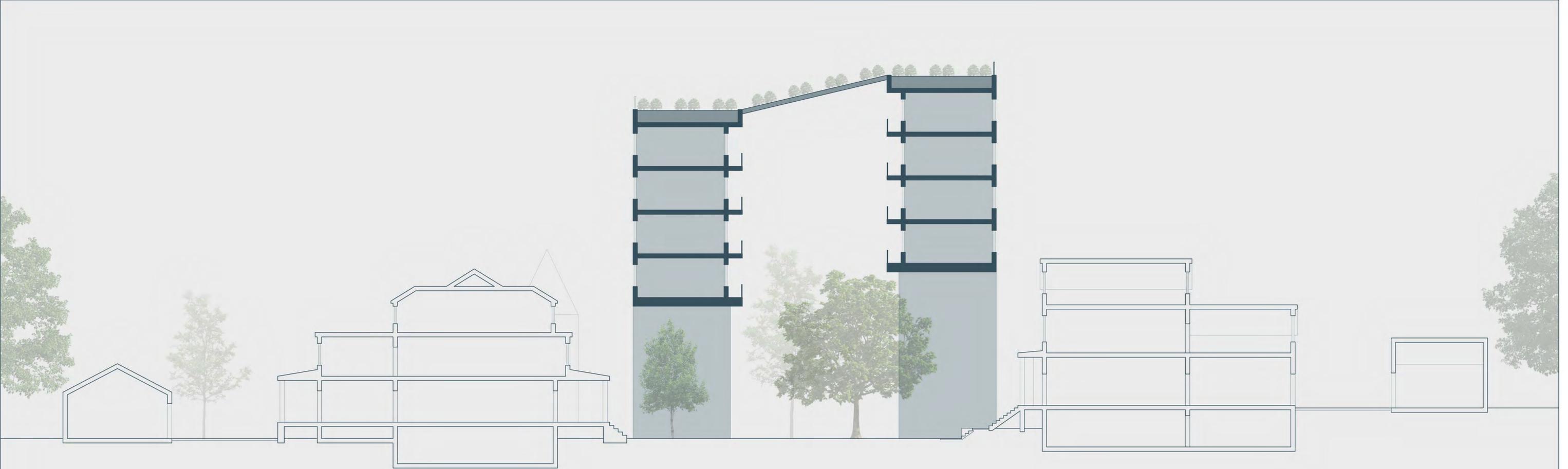
“ADUs provide housing for family members, students, the elderly, in-home health care providers, individuals with disabilities, and others at below market prices within existing neighborhoods” - CA Accessory Dwelling Unit Handbook

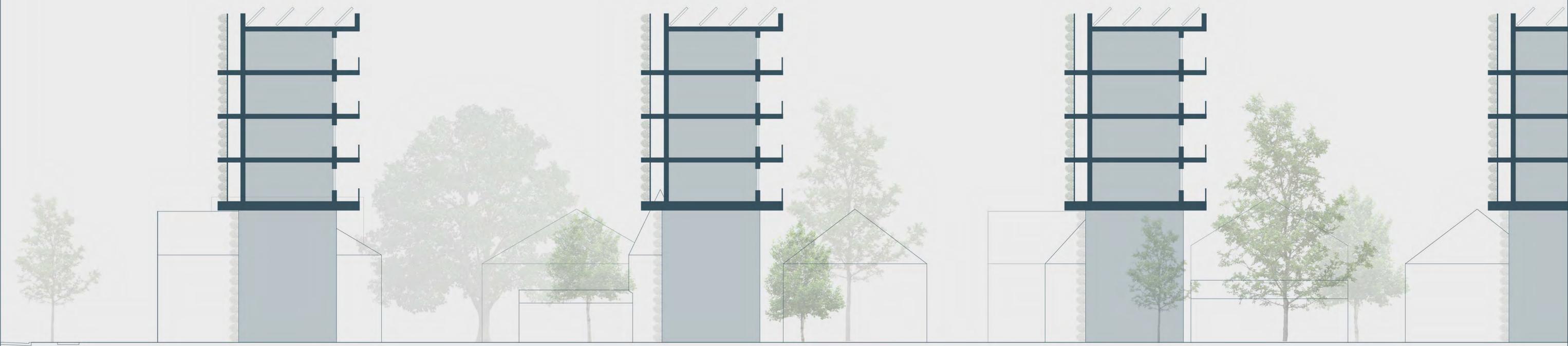
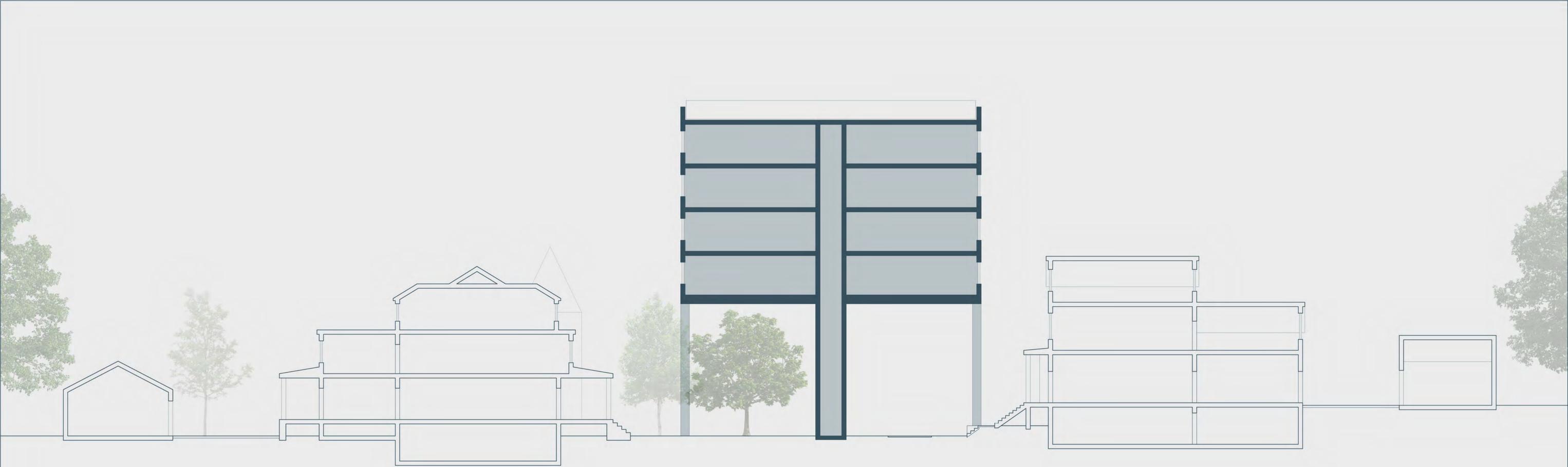


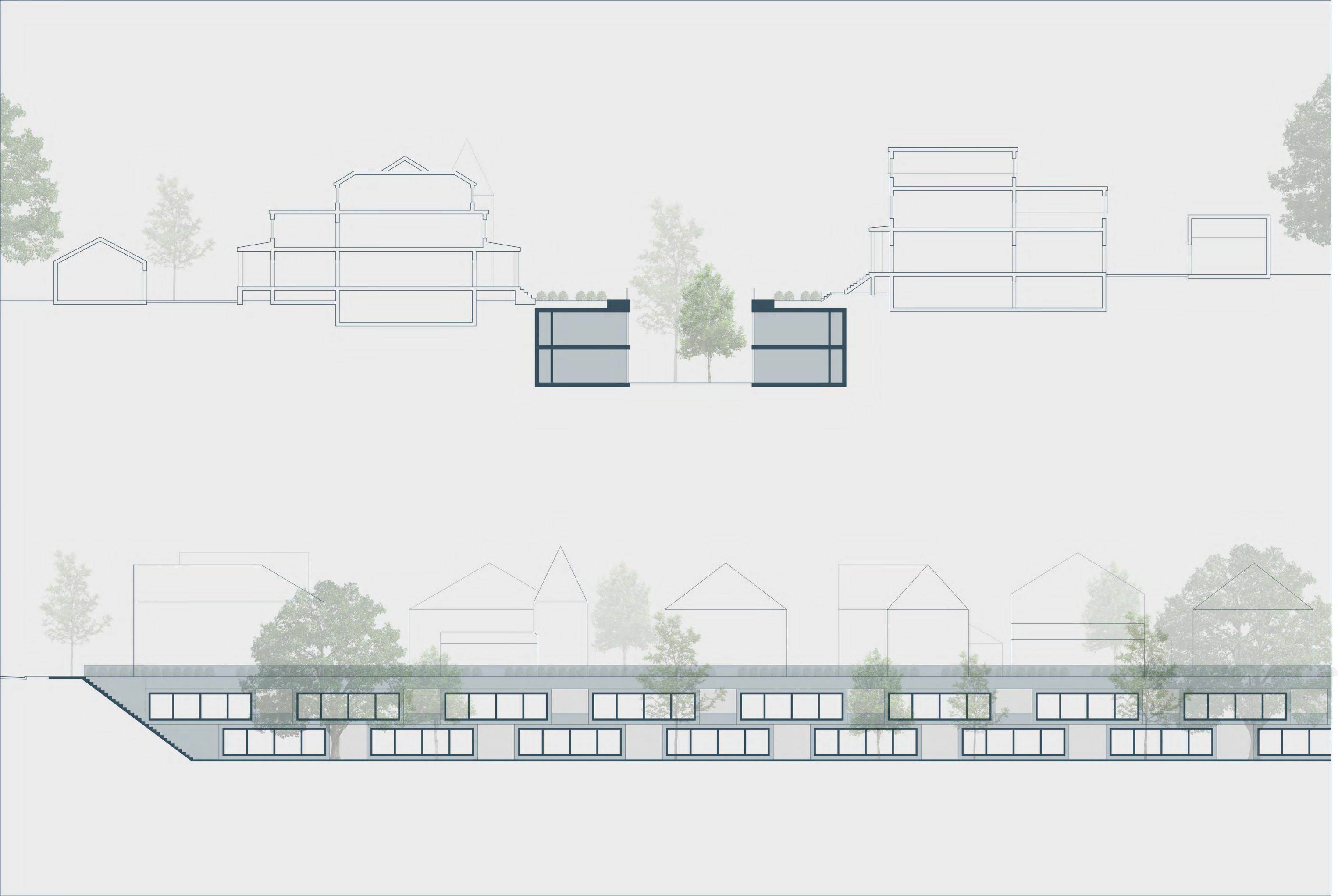
## California ADU Rules

- **Detached ADU:** 1800sqft max, 18' max height
- **Attached ADU:** 50% of home squarefootage max (minimum 800sqft)
- **Conversion Unit:** Existing size is max
- **JADU:** 500sqft max
- **4' lot setback on all ADUs**



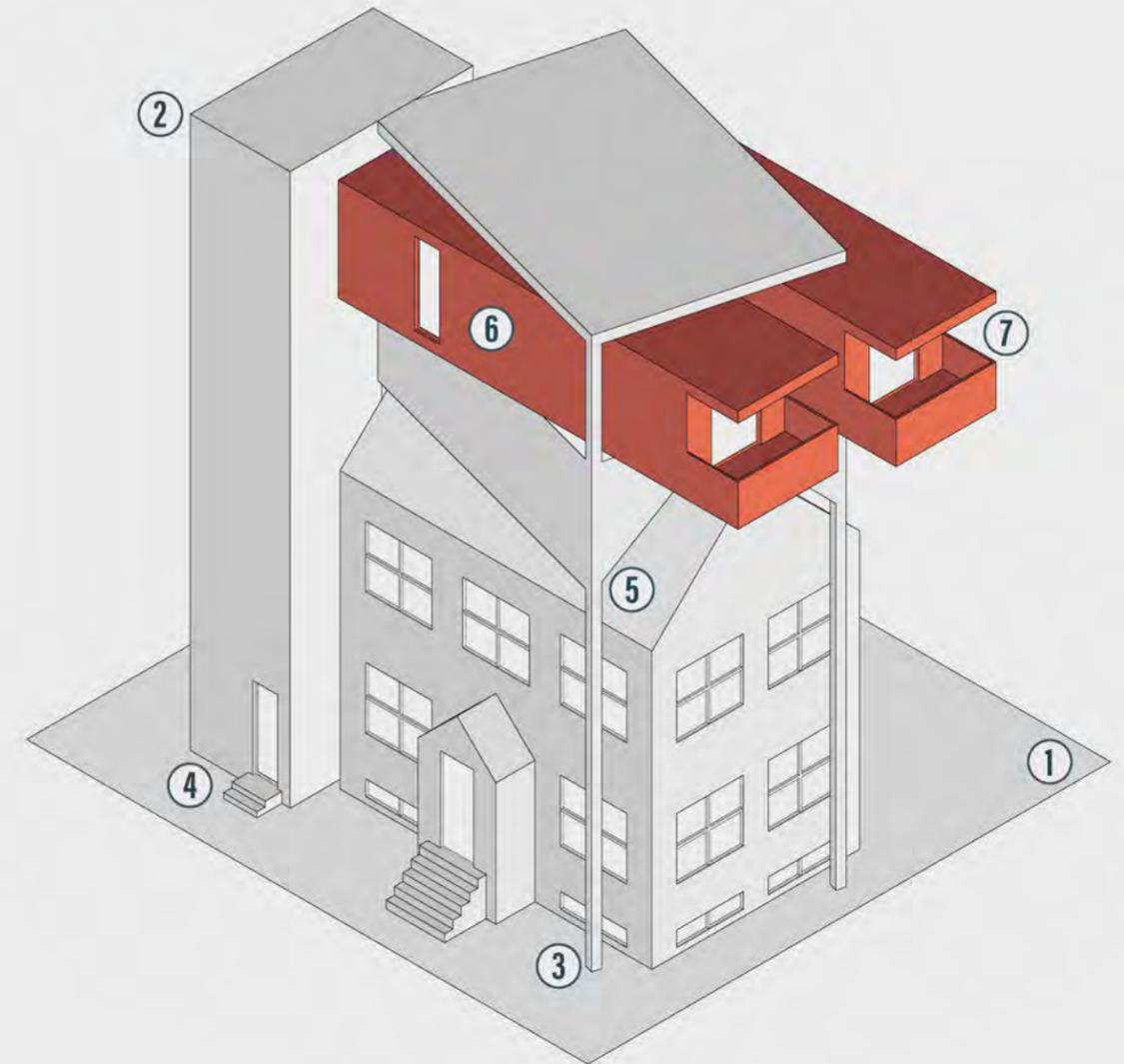






# Regulations

1. Each plot must add one additional resident per 1500sqft of home minimum
2. No maximum number of additional units but there is a max building height
3. The additions cannot rely or use any structure from the existing home
4. Additional unit circulation replaces home driveways
5. The structure of the new units copies the footprint of the site's existing home
6. All units are prefabricated and designed with a single occupant in mind. These prefabricated units are placed on the structure at the discretion of the owner.
7. Each unit must have at least 100sqft of outdoor space which cannot be oriented towards the backyards of homes



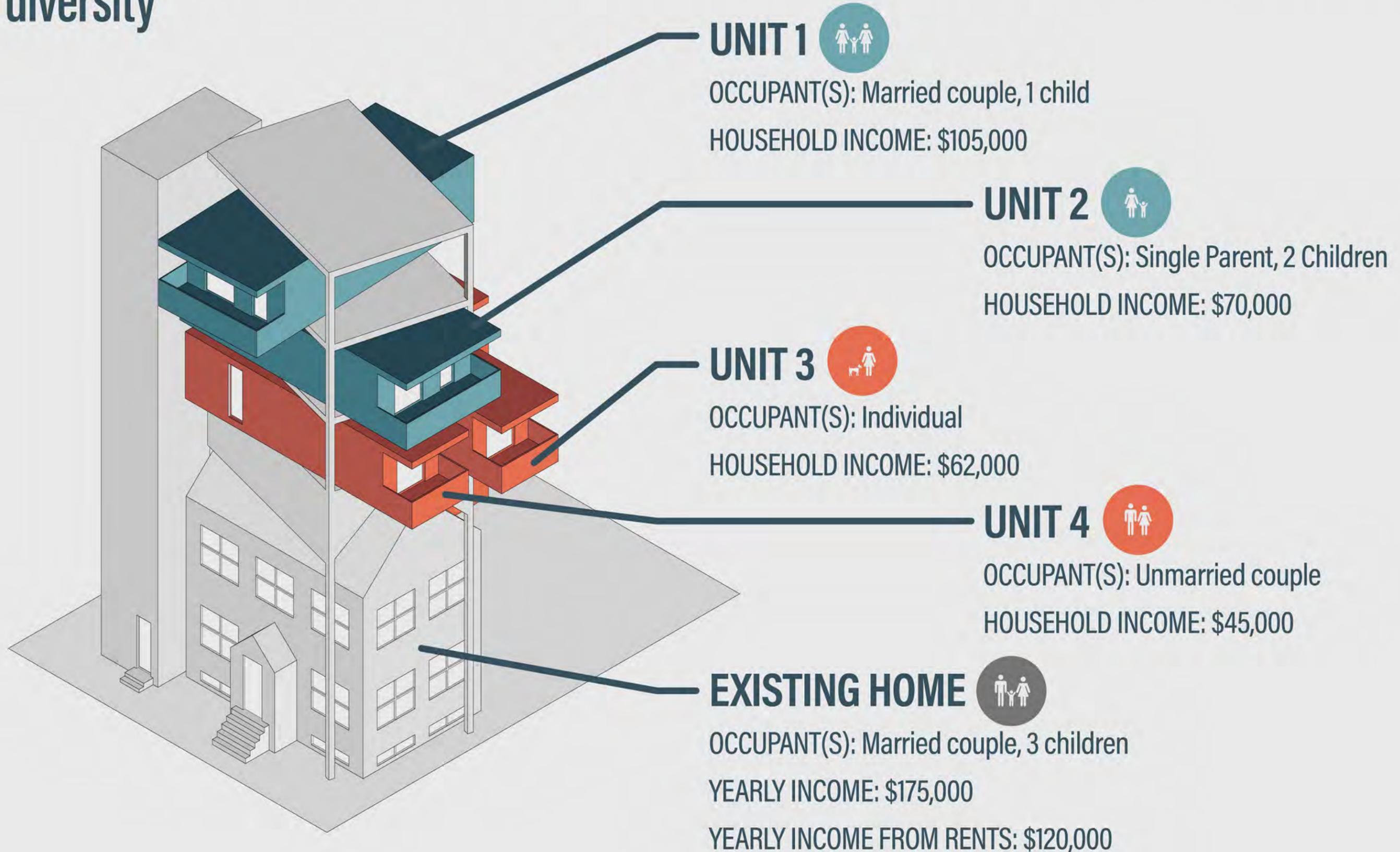
# HOME OWNER OPTIONALITY

While ADUs give a great option to add 1-2 additional residents, suburbia requires a more drastic strategy to fully address its shortcomings.



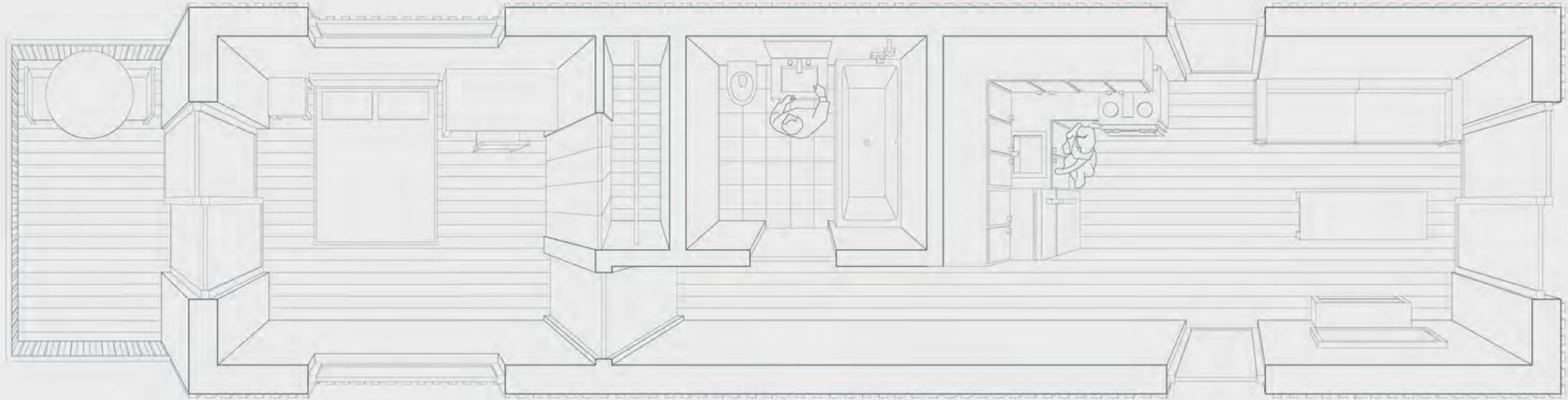
# NEW UNIT DEMOGRAPHICS

These new unit options allow for a greater range in both family size and economic diversity



# 1 BEDROOM APARTMENT

The one bedroom apartments are designed to fit in the gap between homes being only 12' in width. The unit has a variety of different entry locations to give homeowners flexibility to the orientation of these units



# 2 BEDROOM APARTMENT

The two bedroom apartments are designed to fit as narrow of a footprint as possible. The length of the units match the 48' of one one bedroom apartment to allow for the units to stack on top of one another if the homeowner desires.

