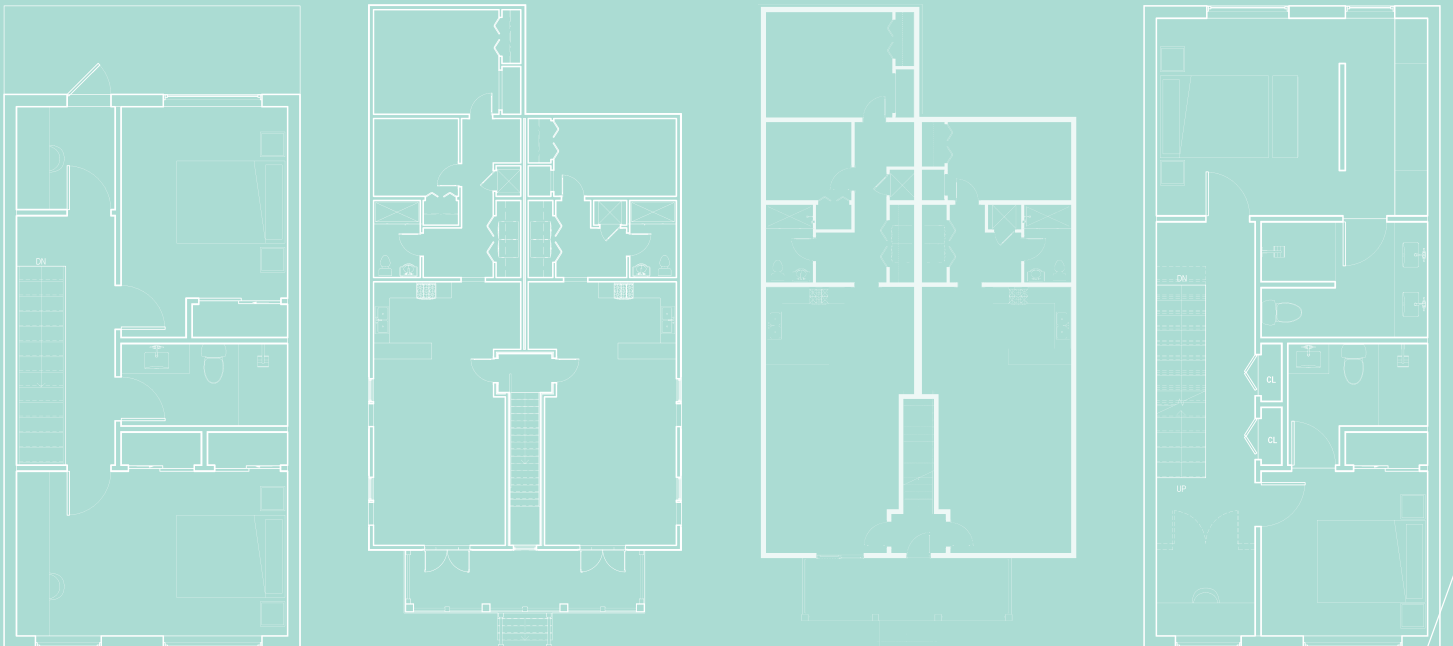# Missing Middle Pattern Book

Acknowledgments

The design team would like to thank the City of Norfolk Department of Planning for initiating this project and for applying for the Community Development Block Grant that allowed this study of Norfolk's Missing Middle to happen. We would like to thank the City Council and the City Manager's Office for their interest and support, and the members of the City of Norfolk Architectural Review Board and the City Planning Commission for their thoughtful feedback and critique. We hope that builders, developers, and citizens are inspired to use this book as a way to generate ideas to support a new (old) way of incrementally developing neighborhoods to respond to shifting demographics and economic changes by creating housing that is affordable and sustainable by design. Finally, thank you to Daniel Parolek, Arthur C. Nelson, and the whole team at Opticos Design. Without their decade of dedication to this subject, architects and urban designers across the country would not be helping cities rediscover their very own Missing Middle.

Table of Contents

Detached Single-Family Houses · Duplex: Side-By-Side + Stacked · Fourplex: Stacked · Courtyard Building · Cottage Court · Townhouse · Multiplex: Medium · Triplex: Stacked · Live-Work · Mid-Rise

Missing Middle Housing

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MISSING MIDDLE

A range of multi-unit or clustered housing types, compatible in scale with single-family homes, that help meet the growing demand for walkable, urban living, respond to household demographics, and meet the need for more housing choices at different price points.

— DANIEL PAROLEK

Introduction

Introduction

Norfolk is a city of neighborhoods. These neighborhoods are tucked alongside rivers, tributaries and creeks that connect to the Chesapeake Bay and the greater Tidewater area. There are patterns to be found in our neighborhoods that relate to their geographical context and climate. Although each neighborhood is as unique as the people who inhabit it, there are similarities to the scale and form of successful neighborhoods and buildings that make people feel comfortable and embraced by the community. In Norfolk's oldest neighborhoods, it may take years of walking, strolling and biking down the street to figure out how the neighborhood was conceived and adapted many times over to serve generations of families and businesses.

The last several decades of zoning and development have conditioned Americans to describe the best neighborhoods as those with only single family homes, but that type of thinking and oversimplification is detrimental to the richness of human habitation and community. We would argue that the best neighborhoods are those where diversity can thrive and equity is just baked into the architectural and urban design recipe. These neighborhoods are those with the magic "Missing Middle" ingredient.

If you've grown up in Norfolk or any of our sister cities, it's likely that you lived in Missing Middle housing. You've definitely seen it while walking or driving around. Interspersed with single family homes are large homes that are divided into two, three, four or more units. Some were built this way, and others were adapted over time. Most of the time you would not even be able to distinguish between a true single family home or a Missing Middle home unless you looked for an extra front door or gas meter. Oftentimes these are the grandest homes in the neighborhood. Sprinkled in amongst the single family homes, the duplexes, triplexes and fourplexes are slightly larger apartments, co-ops and condos that you wouldn't even notice as part of the "single family neighborhood" unless you stopped to think about them.

DIVERSITY AND HOUSING CHOICE

The commonality in all of these neighborhoods is a richness and diversity that happens when a walkable environment is paired with people inhabiting that space at all phases of their lives – young singles, couples, families just starting out, established families, and retirees choosing to age in place are all a part of the mix. Conversations with people with differing backgrounds happen on the streets, on porches, and in neighborhood pocket parks.

Missing Middle is defined by Daniel Parolek, author of the book Missing Middle Housing: Thinking Big and Small to Respond to Today's Housing Crisis as "a range of multi-unit or clustered housing types, compatible in scale with single-family homes, that help meet the growing demand for walkable, urban living, respond to household demographics, and meet the need for more housing choices at different price points." What people define as affordable, or fitting into their budget, changes at various points in their life. Providing multiple types of housing choice inherently increases affordability. Missing Middle is fundamentally about providing housing choice, in "house-scale buildings that happen to have more than one unit within them." Having multiple types and scales of housing allows people to stay in the neighborhood longer as their lifestyle needs and mobility change.

AN AFFORDABLE HOUSING TOOL

A secondary benefit of Missing Middle housing is its affordability. Building at this scale is more cost-effective than large-scale development that does not often mix well with small-scale neighborhoods. The building code allows Missing Middle to use wood-framed, residential construction methods on multi-tenant buildings. They are less complicated to build, less risky to develop, and easier to finance without the need for subsidies. The cost to develop the site and the utility infrastructure is lower, as it is shared by multiple units. Missing Middle housing is affordable, or attainable, by design.

DIVERSITY, EQUITY, INCLUSION IN SMALL BUSINESS GROWTH

For cities prioritizing small business growth, this is a great way to incentivize minority contractors who have the ability to scale up from a single family home to Missing Middle units. When a city prioritizes this type of small business development, training and builder's guilds are established to ensure high-quality development.
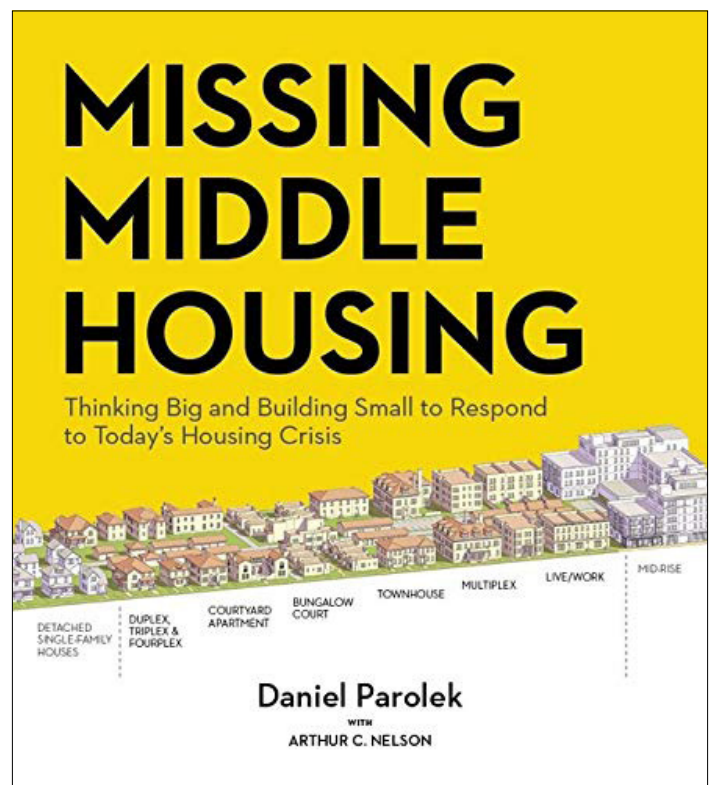
Cover of *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

BUILDING A STRONG COMMUNITY

Missing Middle housing provides similar experiences to living in a single family home with direct connections to the street, and a front door, porches, and balconies facing the street. This is a very different experience than walking into the lobby of a large apartment building and walking down an internally lit, double-loaded corridor to get to your front door. The experience one has upon entering Missing Middle housing feels like home to those who are downsizing from single family homes, thus making the transition easier.

Missing Middle housing helps create and strengthen community bonds with shared spaces or just by being located withing a walkable environment, often rich with small, locally owned businesses. This is important when considering the growing number of single-family households filled with young workers, professionals or retirees who want to feel connected to their community.

HISTORY

It's important to note that Missing Middle is not a new concept, just a forgotten one that needs to be revived. In the early 1900s, the Sears, Roebuck and Co. catalog sold dozens of Missing Middle house plans and kit houses. These kit houses were tools for immigrants who were able to save, build a two or three unit building, live in one unit, and collect rent from the others to pay the mortgage and provide a predictable income. Historically, Missing Middle housing provided a way for lower-income families to attain middle-income status by building equity in an investment and move up in society.

SHIFTING DEMOGRAPHICS, DEVELOPER RISK AND NIMBY-ISM

As demographics have shifted and market demand for walkable urban and semi-urban neighborhoods has increased, the housing market has not been able to meet communities' needs. The majority of what has been built in the past four decades falls into two categories: 1) single family detached homes and, 2) large-scale apartment complexes with over 100 units. These development proposals are a direct reaction to density and use-based zoning ordinances (Euclidean zoning) and increasingly complex, unpredictable, and time-consuming entitlement processes. The same amount of work and steps are often involved in permitting and financing a fourplex as a 120-unit building. Thus, the risk tolerance for developers does not allow for new Missing Middle housing, and full-block apartments, inserted into smaller-scale neighborhoods has become the norm. The reaction from neighborhoods has been strong and swift when large apartment buildings have been proposed in majority single family areas, and a culture of NIMBY-ism (Not in My Backyard) was born.

Main Street Mixed-Use
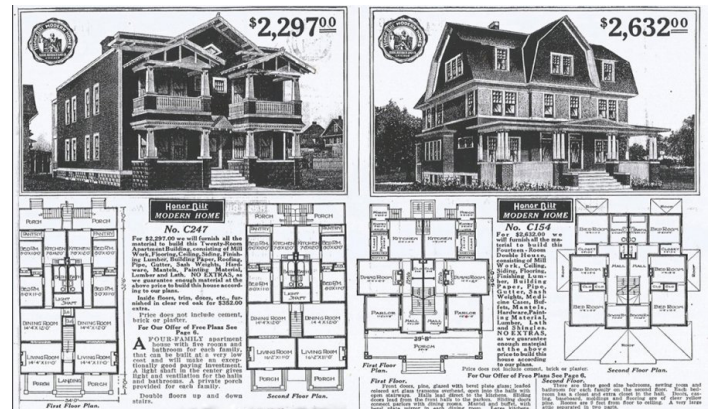
Pages from the Sears, Roebuck and Co. catalog showing Missing Middle housing

NEXT STEPS TO ENABLE MISSING MIDDLE HOUSING

In order to make room for Missing Middle housing, Norfolk will have to make changes to the current zoning ordinance. The changes may include building height, off-street parking requirements, accessory dwelling units, and more.

If Norfolk wants to make a big impact on growing small and minority-owned residential construction businesses, then we will need to provide education on the differences between the Virginia Residential Construction Code (governs up to two units) and the Virginia Commercial Construction Code (governs all multifamily over two units). This will ensure that Missing Middle housing is affordable by design and provides a way to grow the local economy.

REFRAMING THE CONVERSATION AROUND HOUSING

A successful approach to begin building Missing Middle housing that has likely not been built in over five decades is to first listen to residents and then re-frame the way we talk about housing and zoning. Why do residents love their neighborhood? What don't they like? What are their aspirations for the future? What qualities of a neighborhood do they want to enjoy as they get older and as their kids grow up? What would make them feel safe letting their kids walk or ride their bikes around the neighborhood? Have they struggled to find high-quality, affordable housing for themselves, friends, or family?

Remember that Missing Middle is about:

- *The form, scale, and type of housing that fit in with single-family* walkable neighborhoods

- *House-scale buildings* that happen to have multiple tenants in them (both renters and homeowners)

- *Housing choice* — broad range of housing types such as duplexes, triplexes, "Norfolk six-packs", town homes, courtyard apartments, cottage courts and more

- *Attainability* — high quality homes that are sustainably affordable by, virtue of design, for our workforce — teachers, firefighters, nurses and long-term care professionals.

Reintroducing or introducing Missing Middle housing into a neighborhood must be done in a sensitive way, and with the support of the neighborhood. The best way to start is with walking tours led by a knowledgeable architect or planner and longtime community members who know the neighborhood well. From there, key sites can be identified, barriers to this growth can be identified and changed, small zoning, area plans, or overlay changes can be made, and "urban acupuncture" can begin!


N. Belmont Ave. Duplex — Richmond, VA

The Case for Missing Middle

From "Guiding Growth in Charleston's Historic District" by Bevan & Liberatos

Stories:	6
Bedrooms/acre:	109
Commercial:	28,000 sqft
Land area coverage:	100%
Porches:	0
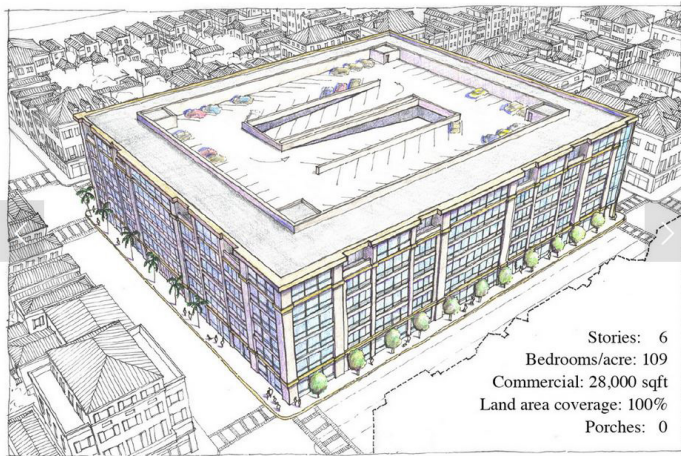
This image illustrates a 6-story "Texas donut" style mixed-use building wrapped around a parking garage. It is built to the property line and maximizes the allowable footprint.

Stories:	2-4
Bedrooms/acre:	108
Commercial:	28,000 sqft
Land area coverage:	62%
Porches:	68
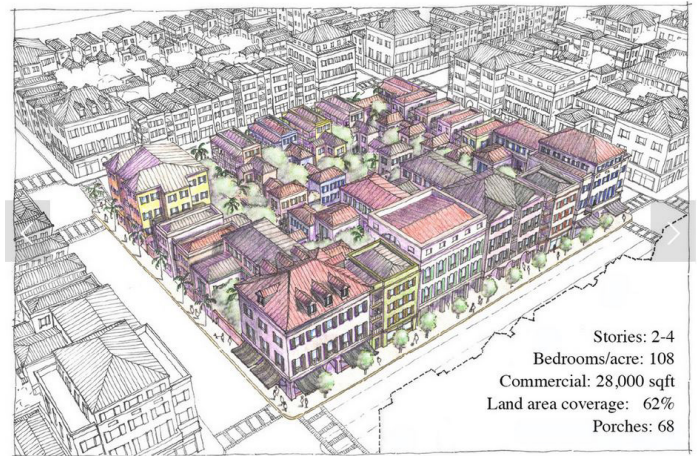
This image illustrates 2-4 story (individual buildings vary in height) mixed-use development that meets the same bedroom/acre density as the image to the left, but does so with increased green space, decreased land area coverage, and porches to interact with the street. This option fits in better with the character of historic Charleston and provides a more engaging experience.

CHARACTERISTICS OF MISSING MIDDLE HOUSING:

1. Walkable context
2. Lower perceived density
3. Smaller, well-designed units
4. Fewer off-street parking spaces
5. Provides affordability/attainability
6. Strong Sense of Community

OWNERSHIP & RENTAL STRUCTURES FOR MISSING MIDDLE HOUSING:

1. Fee Simple (townhouses and cottage courts)
2. Condos
3. Co-ops
4. Apartments

Missing Middle should always be "Mixed-In"
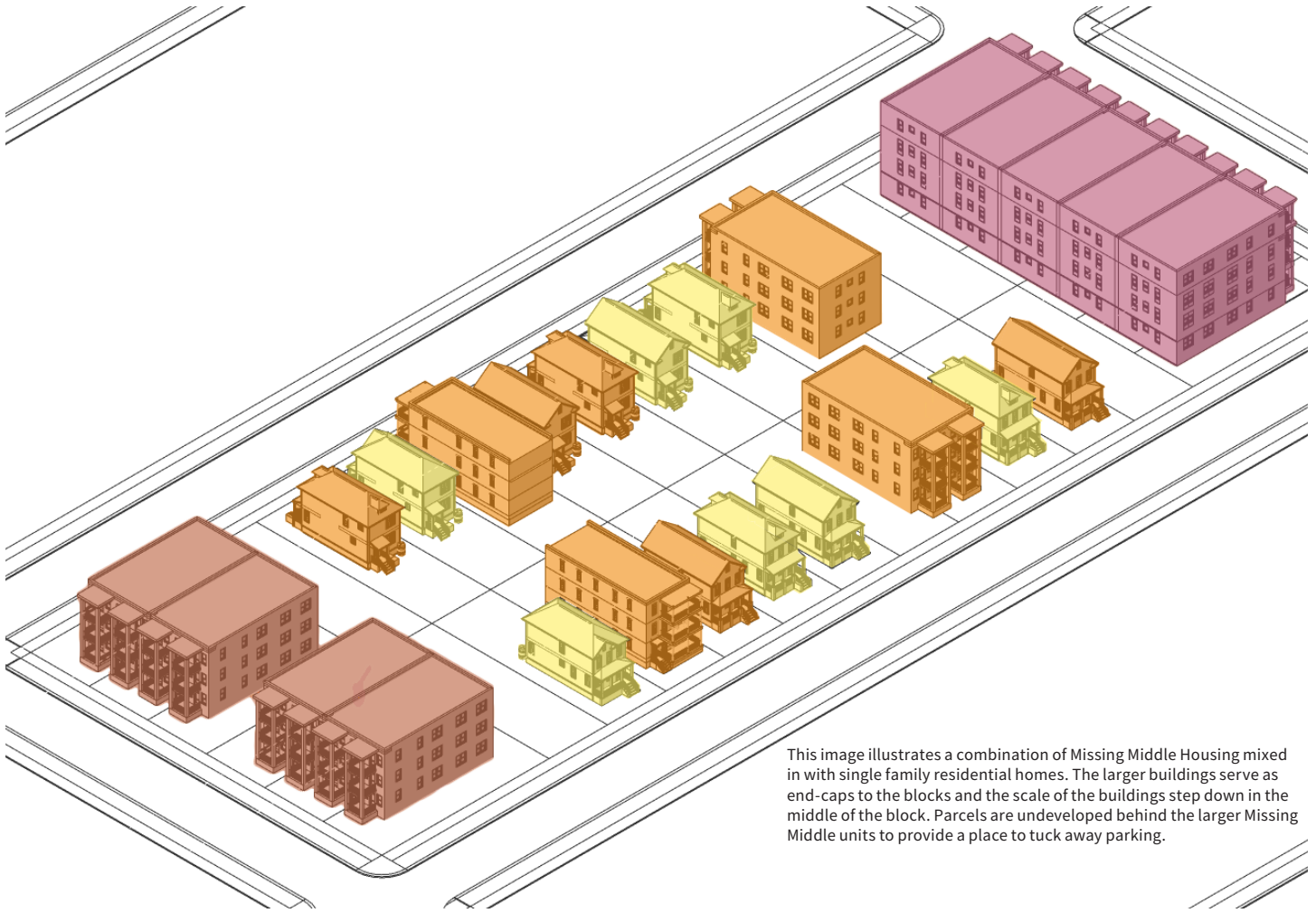
This image illustrates a combination of Missing Middle Housing mixed in with single family residential homes. The larger buildings serve as end-caps to the blocks and the scale of the buildings step down in the middle of the block. Parcels are undeveloped behind the larger Missing Middle units to provide a place to tuck away parking.

This rendering shows a test site for Missing Middle on Granby Street, where Missing Middle housing could be mixed in with single family homes.

How to use the Pattern Book

How to use the Pattern Book

This pattern book is a guide to developing your own Missing Middle building.

1. Find your Character District and Zoning District

Knowing which Character District and Zoning District your property is in will determine whether a Missing Middle building is permitted by right, or by Conditional Use Permit, or not permitted. It will also determine the setbacks necessary to maintain from the property lines, the building height limitations, lot coverage maximum, and parking requirements among other factors.

One of the easiest ways to determine these districts for your property is to go to the NorfolkAIR website where you can input the address of the property and look up the relevant information for your parcel.

2. Determine your lot size and unit count

Using the information from above, you can determine the buildable area of your lot and get an idea of how many units you'd like your building to have. The example building plans in this book have been illustrated on parcels which are a combination of several 25-foot to 35-foot wide lots. These lot sizes are typical for Norfolk neighborhoods. If you have 1 to 2 lots in your parcel, then a smaller building in the range of a duplex to a 6-unit building is likely going to fit. If you have more than 2 lots, you can either look into building multiple smaller buildings, or constructing a larger 8-unit to 12-unit building.

3. Calculate how much parking you need

Once you know how many units you want to build and which Character District and Zoning District the site is in, you'll be able to calculate the required off-street parking that must be provided on your site plan.

4. Meet with the Planning Department

Set up a meeting with the Planning Department to review your proposal and establish a process to complete your project. They can help with any questions you might have.

5. Pick a building type and style

Using the plans and designs presented in this book, select a set that works with your site and provide the number of units that you want to build. You will need to work with an architect to draft plans that can be used for construction. The design does not need to exactly replicate those in this book, but should generally reflect the size, layout, and details of the version that you chose to use as a guide.

6. Select Materials and Finishes

The material and finish palettes provided in this book should be used to select those that will be applied to your building. Colors and patterns may certainly vary from building to building, but the materials listed in the Approved Materials & Finishes section are the only ones approved for Missing Middle buildings. If you transition from a brick front facade to a different material cladding on the sides, that transition should happen at least 12 feet behind the front facade.

7. Incorporate the resilience and construction tips into your building plans

The Resilient Construction and Sustainable Design section has several strategies and tips to help your design meet the Resilience Quotient requirements of the Zoning Ordinance and some to help lower the overall cost of ownership over time. Work with your architect to incorporate these into your design so that you, your tenants, and future owners can enjoy their time in a beautiful building while not unnecessarily spending money on energy costs or upgrades.

*This **IS** Missing Middle*

*This is **NOT** Missing Middle*

Missing Middle Precedents/ Typologies

Precedents

The following precedents are mostly taken from Norfolk, with a few precedents from Virginia Beach and from Richmond, Virginia. Studying the history of the built environment is always important when beginning a new design or construction project. However, it is even more important when beginning a program for Missing Middle, as it is critical to point out that the very building type that may be debated for its appropriateness, already exists where you haven't been looking for it!
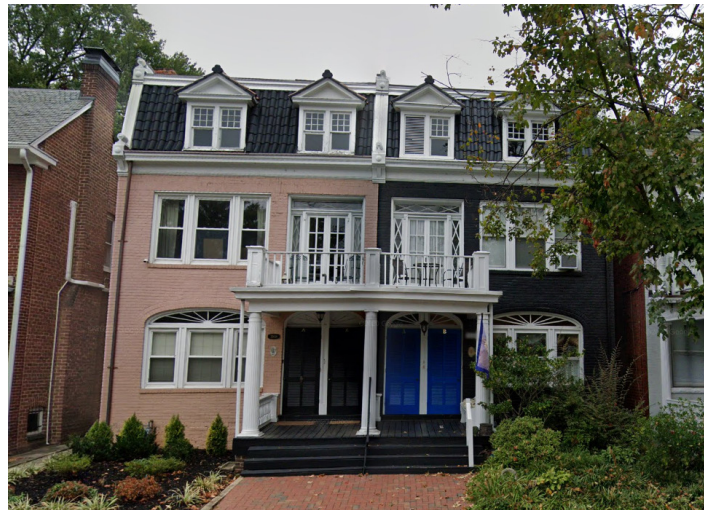
DUPLEX — SIDE-BY-SIDE

Ocean View, Norfolk, VA

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Ocean View, Norfolk, VA

Floyd Ave, Richmond, VA

DUPLEX — STACKED

Floyd Ave, Richmond, VA

West Grace St, Richmond, VA

Graydon Ave, Norfolk, VA

Graydon Ave, Norfolk, VA

Duluth, MN

Harrington Ave, Norfolk, VA

TRIPLEX — STACKED

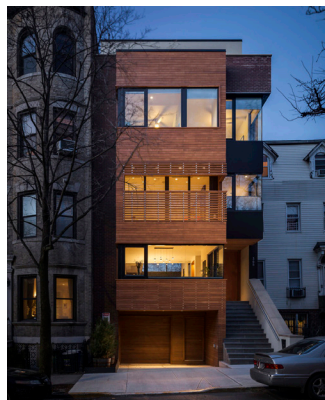Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Graydon Ave, Norfolk, VA

Westover Ave, Norfolk, VA

Brooklyn, New York

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

TRIPLEX — SIDE-BY-SIDE

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

CORE Modern Homes, Toronto, Canada

FOURPLEX — STACKED

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Graydon Ave, Norfolk, VA

East Beach, Norfolk, VA

East Beach, Norfolk, VA

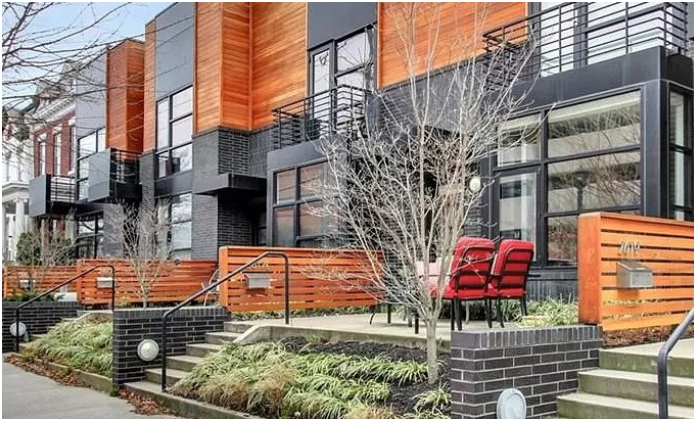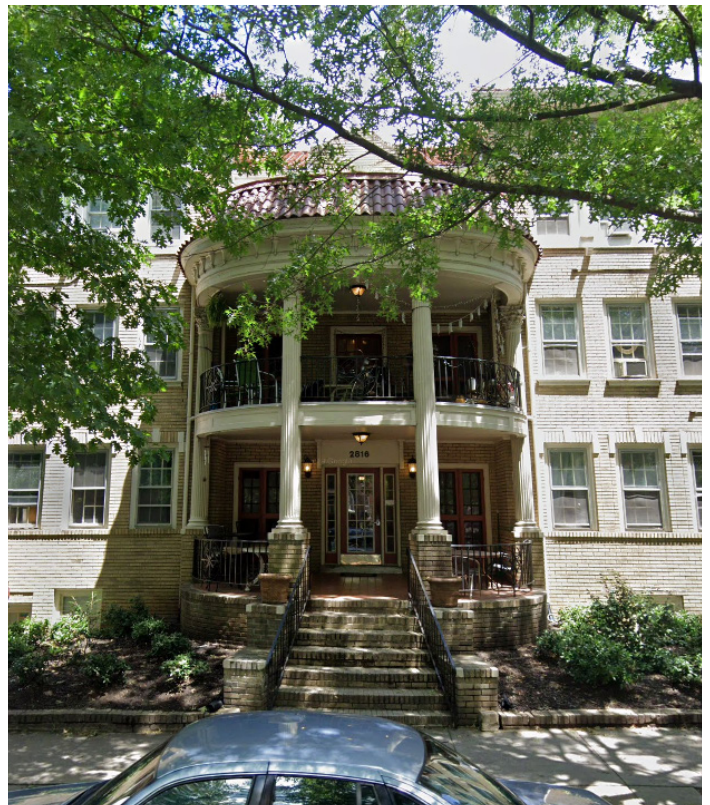Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

PB Elemental Architecture, Beacon Hill Washington

FOURPLEX — SIDE-BY-SIDE

Citizen 6 — 2619 Floyd Ave, Richmond, VA

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

West Main St, Richmond, VA

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design
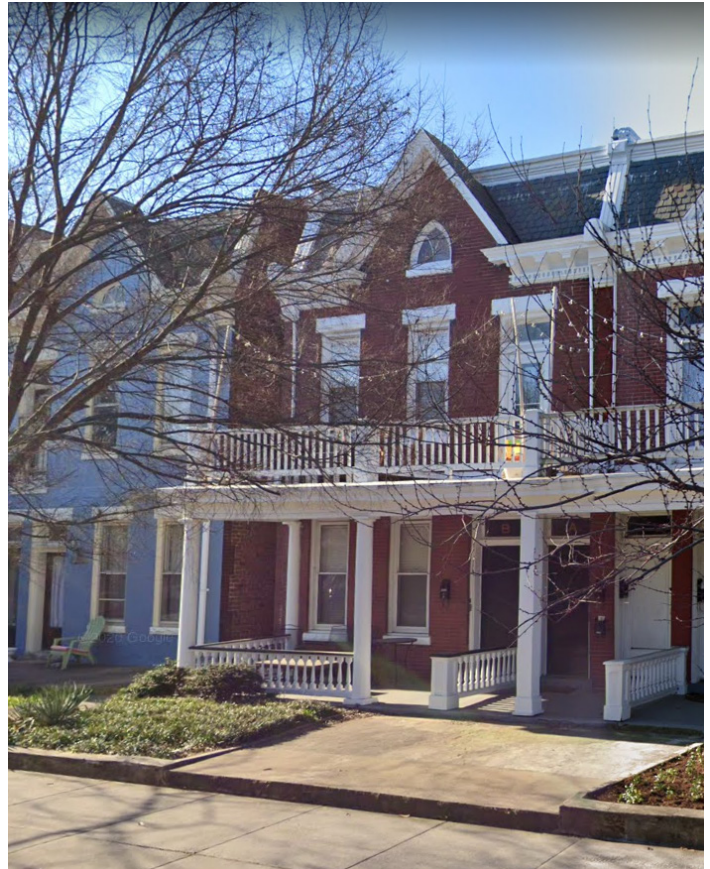
2816 Monument Ave, Richmond, VA

SIXPLEX — STACKED (THE "NORFOLK SIX-PACK")

323 W. 28th St, Norfolk, VA

706 N. Arthur Ashe Blvd, Richmond, VA

824 Brandon Ave, Norfolk, VA

720 Redgate Ave, Norfolk, VA
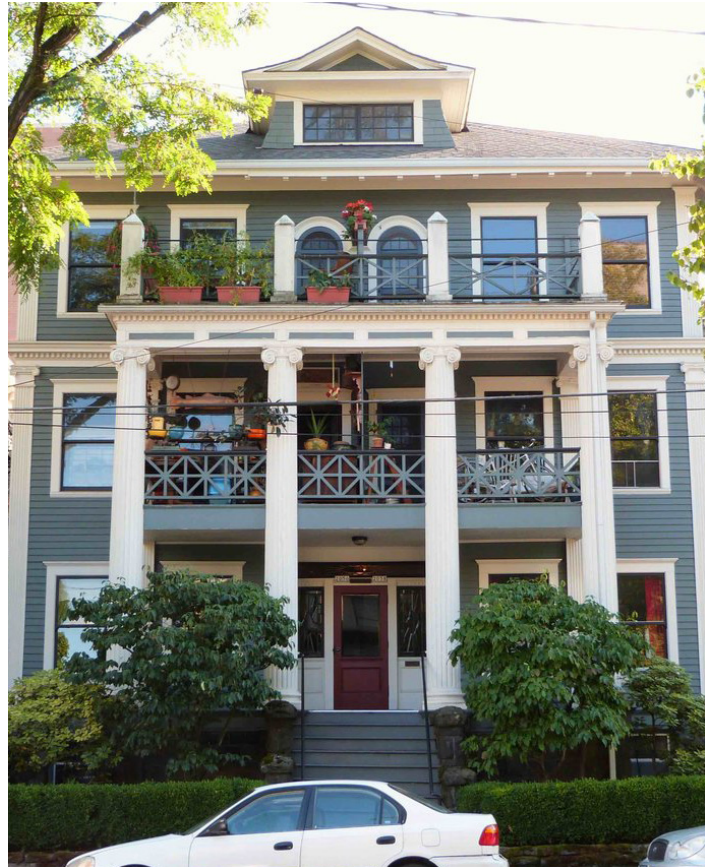
SIXPLEX — STACKED + SIDE-BY-SIDE

North Arthur Ashe Blvd, Richmond, VA

Stockley Gardens, Norfolk, VA

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Brandon Ave, Norfolk, VA

Monument Ave, Richmond, VA

THE COTTAGE COURT — SMALL COTTAGES AROUND A CENTRAL GREEN

East Beach, Norfolk, VA

The Cottage Company, Kirkland, WA

The Cottage Company, Shoreline, WA

Cottage Court at the Cavalier Residences, Virginia Beach, VA

The Cottage Company, Kirkland, WA

The Cottage Company, Bainbridge Island, WA

COURTYARD APARTMENTS

Westover Ave, Norfolk, VA

Westover Ave, Norfolk, VA

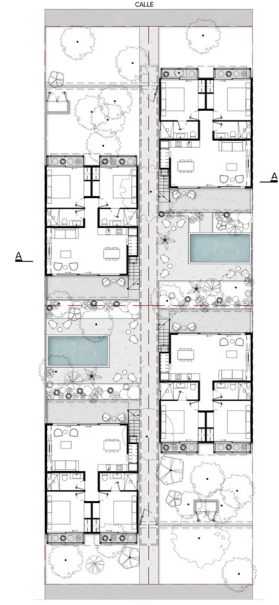Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

LOHA Architects, Los Angeles, CA

Works Progress Architecture, Portland, OR

LOHA Architects, Los Angeles, CA

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

TOWNHOUSES & MULTIPLEX

22 Neptune, 22nd St, Virginia Beach, VA

East Beach, Norfolk, VA

Harrington Ave, Norfolk, VA

Greenway Ct, Norfolk, VA

Matoaka St, Norfolk, VA

LIVE-WORK UNITS

East Beach, Norfolk, VA

Habersham, Beaufort, SC

West Olympia Coffee Co., Seattle, WA

ACCESSORY DWELLING UNITS & MULTI-GENERATIONAL LIVING

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

Credit: *Missing Middle Housing* Book by Daniel Parolek of Opticos Design

IMS House, Garden Office

StudioShed — Signature Model — Prefab Sheds

East Beach, Norfolk, VA

B9 Architects — 335 Dadu — Seattle, WA

Atlanta, GA

Oregon City, OR

Clive, IA — Zenith Design-Build

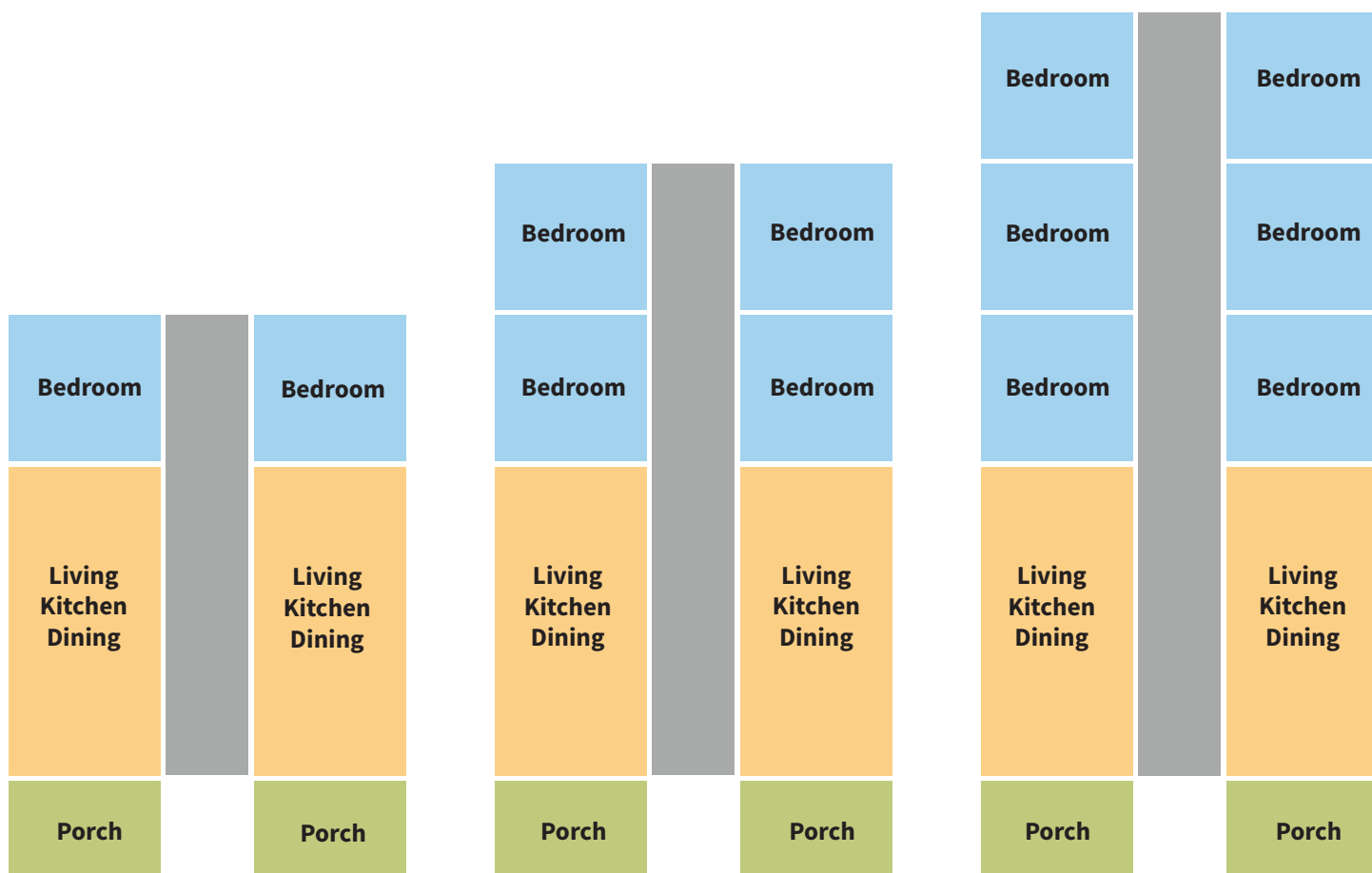Chicago, IL — Heartland Garage Builders

East Beach, Norfolk, VA

Atlanta, GA

Design Ideas:
Plans & Renderings

Plan Diagrams

Bedroom		Bedroom
Living Kitchen Dining		Living Kitchen Dining
Porch		Porch

Bedroom		Bedroom
Bedroom		Bedroom
Living Kitchen Dining		Living Kitchen Dining
Porch		Porch

Bedroom		Bedroom
Bedroom		Bedroom
Bedroom		Bedroom
Living Kitchen Dining		Living Kitchen Dining
Porch		Porch

WPA studied the patterns of the turn-of-century Missing Middle, specifically three-packs and Norfolk six-packs. The beauty in these plans is that they are fully modular and can fit on narrow-width lots. The number of bedrooms can increase with increases in lot depth and the units can be placed side by side to turn 6-packs into 12-packs, etc. These building types work best when mixed in with single family homes, or as bookends to neighborhood streets, as a way to transition to neighborhood main streets.

WPA
WORK PROGRAM ARCHITECTS

1-Bedroom Unit

WPA

1 Bedroom Plan (Smallest Building Area)

- One Bedroom – One Bathroom Apartments with Private Balconies

- Living Room: 200 square feet

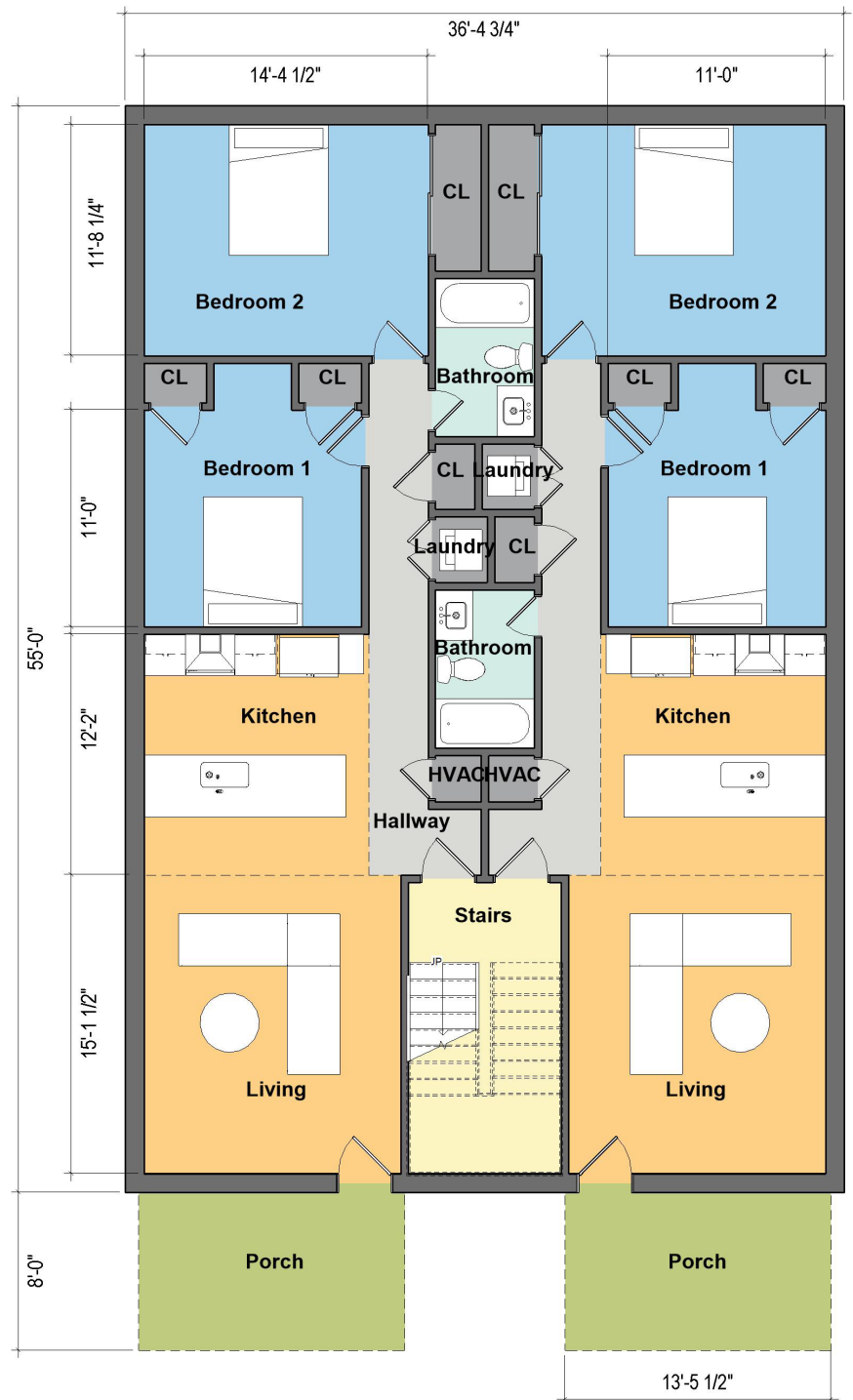- Kitchen: 140 square feet

- Bedrooms: 160 square feet

2-Bedroom Unit

WPA

2 Bedroom Plan

- Two Bedroom – One Bathroom Apartments with Private Balconies

- Living Room: 200 square feet

- Kitchen: 140 square feet

- Bedrooms: 130 or 170 square feet

36'-4 3/4"

14'-4 1/2"

11'-0"

11'-8 1/4"

CL CL

Bedroom 2   Bedroom 2

CL   CL   Bathroom   CL   CL

11'-0"

Bedroom 1   CL Laundry   Bedroom 1

55'-0"

Laundry CL

Bathroom

12'-2"

Kitchen   Kitchen

HVAC HVAC

Hallway

15'-1 1/2"

Living   Stairs   Living

JP

8'-0"

Porch   Porch

13'-5 1/2"

3-Bedroom Unit

3 Bedroom Plan (Largest Building Area)

- Three Bedroom – Two Bathroom Apartments with Private Balconies

- Living Room: 200

- Kitchen: 140 square feet

- Bedrooms: 130 - 160 square feet

Interchangeable Elevations — Renderings
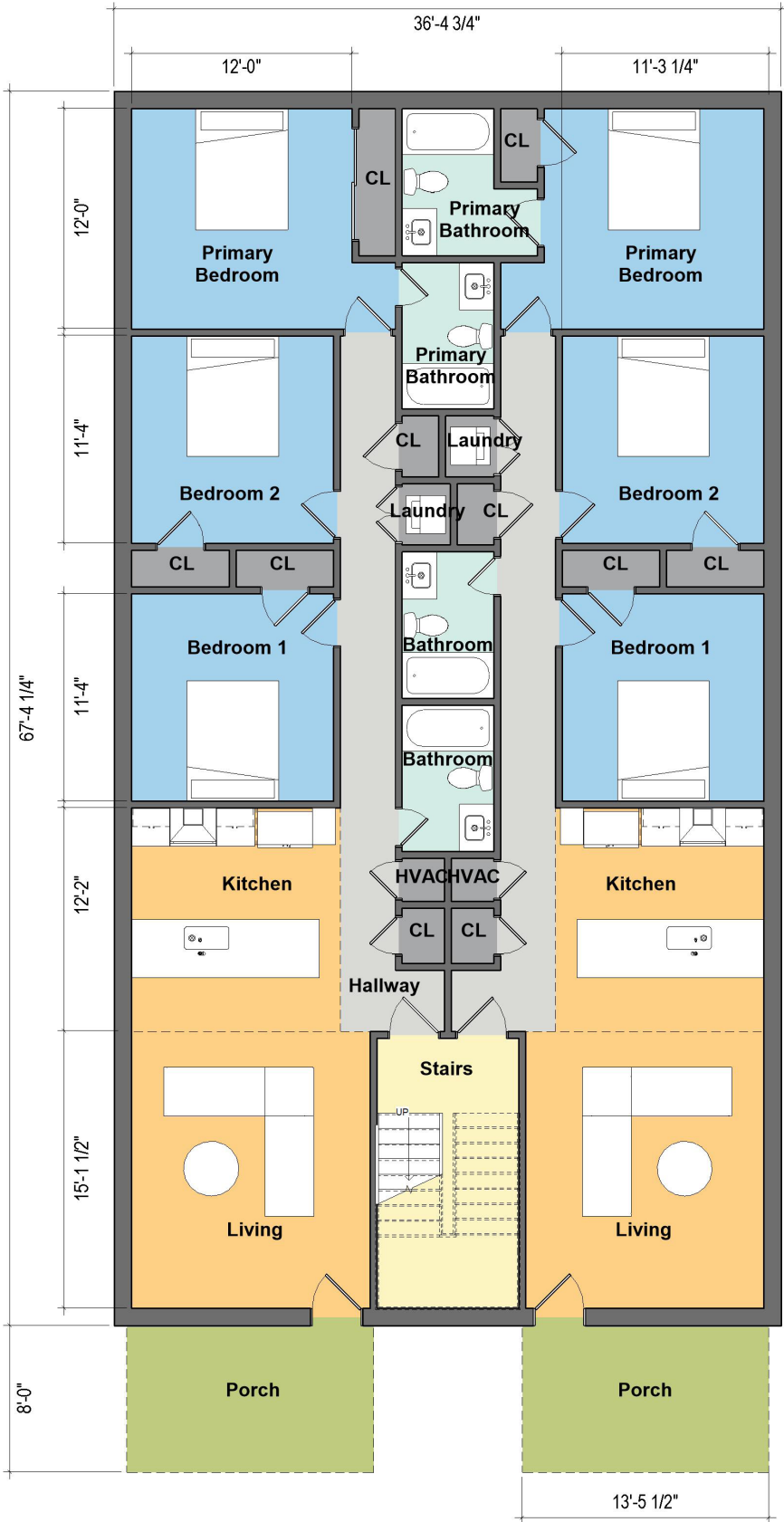
Traditional — separate porches; change at third floor

Traditional — fully connected porch; change at third floor

The Missing Middle

Traditional — fully connected porches

Traditional — separate porches

Traditional — 2-story porch for smaller neighborhood scale

Traditional — fully connected porches

Contemporary — Traditional & Coastal

Coastal Character District

Contemporary — Coastal

Contemporary — All Character Districts

Traditional Character District color palette

**Coastal Character District color palette**

Modular Components

First Floor

Laundry Closet — 3'-6" × 6'-0"
Powder Room — 8'-0"
Coat Closet — 12'-0", 3'-0", 2'-6"
Living — 13'-0" × 12'-6"
Kitchen — 12'-6"
Dining — 12'-6"

Second Floor

Primary Bedroom — 16'-6" × 12'-6"
Nook — 6'-6"
Bathrooms — 12'-6"
Bedroom — 12'-6"
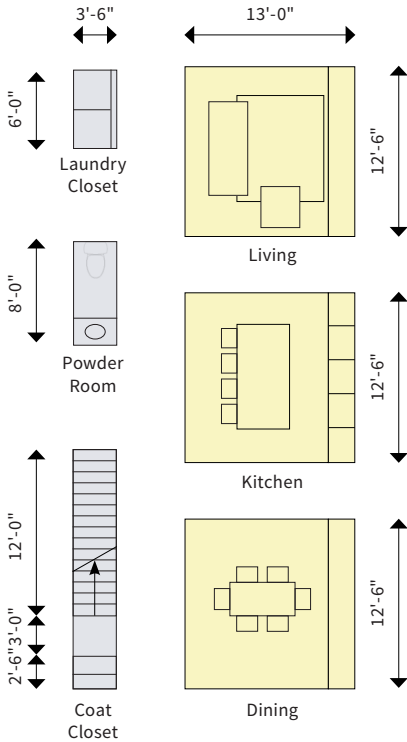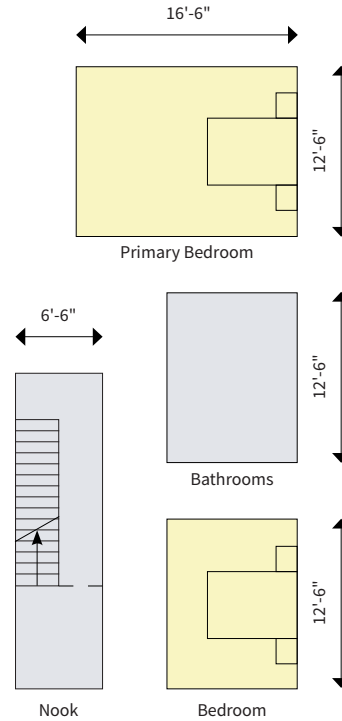
The following plans from GARC are made up of fully modular room sizes and components that can be interchanged to allow reconfigurations within each unit to respond to different contexts.

The variations based on Basic Type Units form a family with seven unit types. All unit types can be paired with either the same or a different unit type within the family to create side-by-side duplex, triplex, multiplex, or townhouse units to fit on different lot sizes. Porches can be added to the front or rear of the unit (see 3D study, next page).

16'-6" · 37'-6"

Primary Bedroom · Bathrooms · Bedroom · Living · Kitchen · Dining
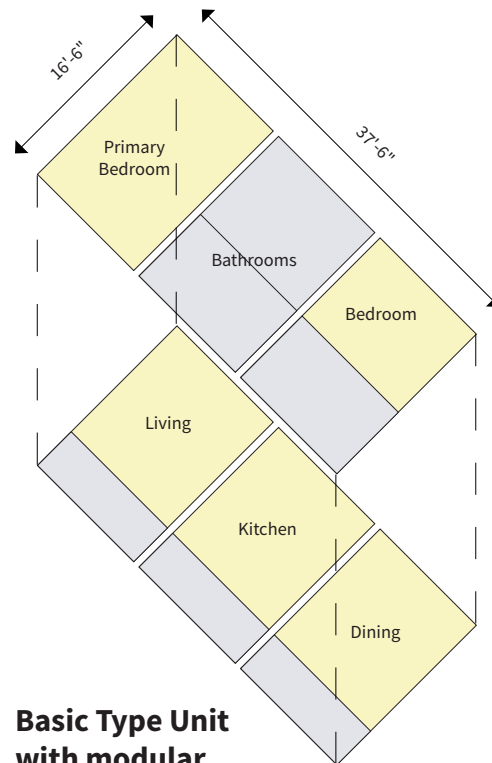
Basic Type Unit with modular components
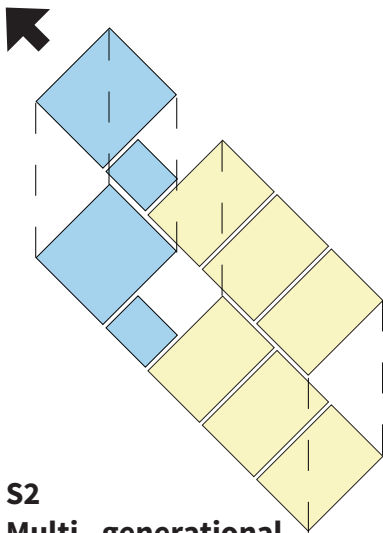
GARC

Unit Type Family
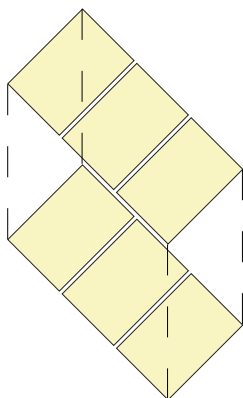
B1
Basic Type 1 (2 bed)
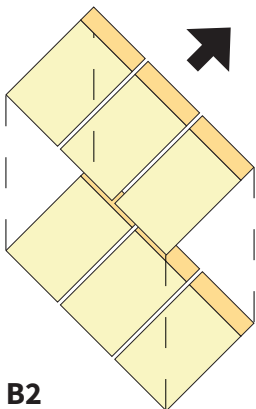
B2
Basic Type 2 (3-bed)
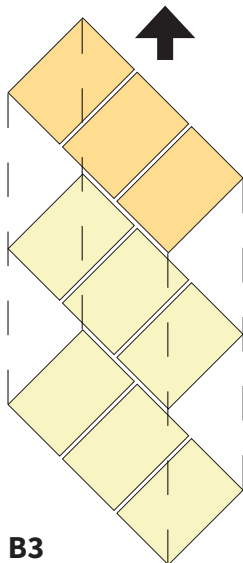
B3
Basic Type 3 (4-bed)
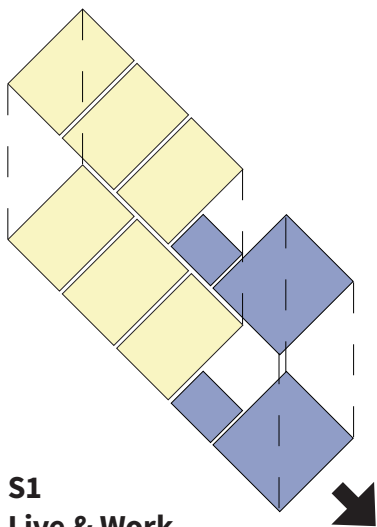
S1
Live & Work
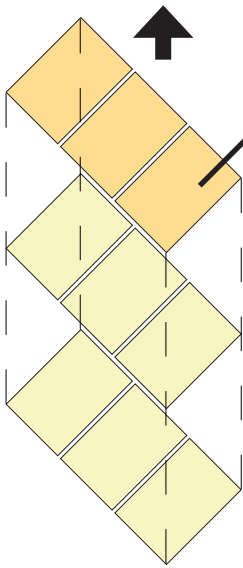
S2
Multi - generational
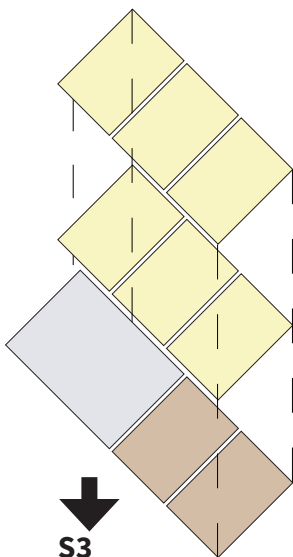
S3
Garage + ADU
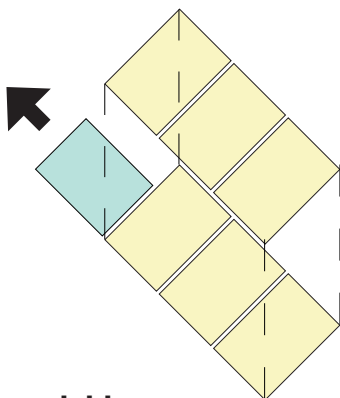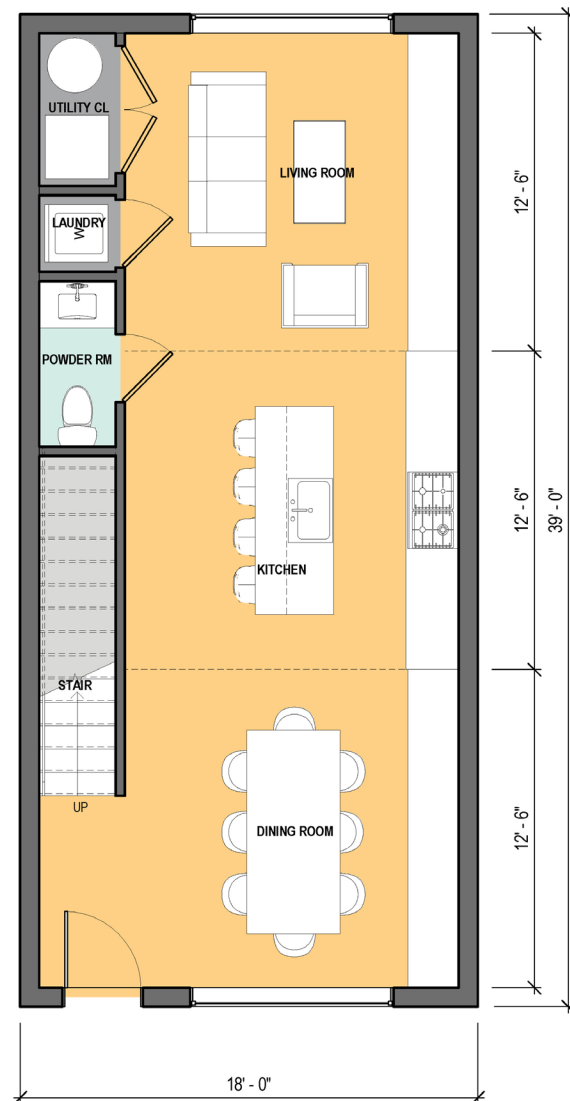
S4
Expandable

Basic Type 1 & 3 — B1 & B3

**Optional 3rd floor
to add bedrooms**

B1:

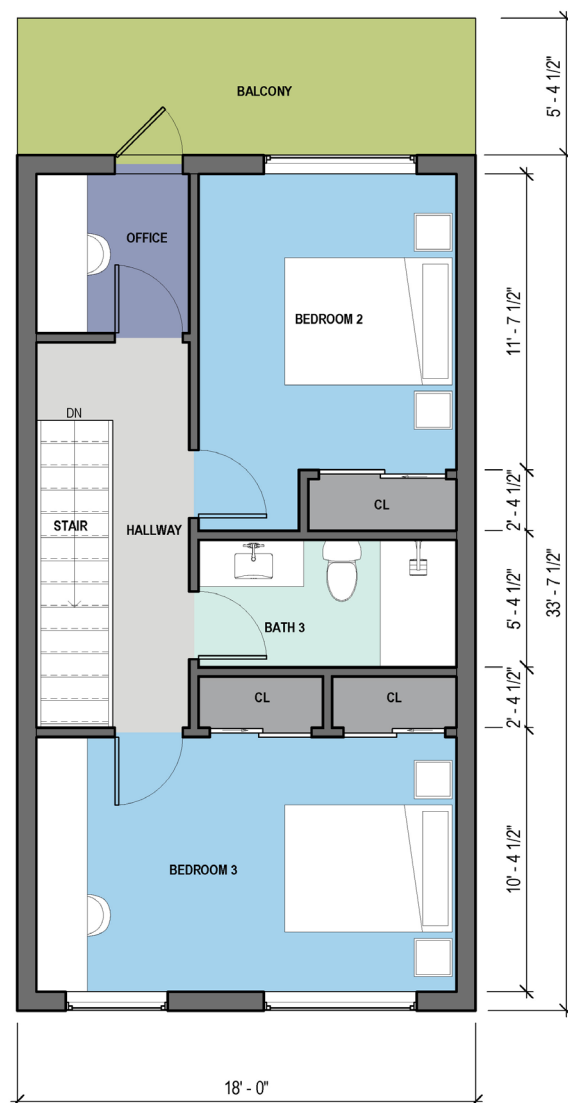- Two-bedroom unit
- Two stories
- 1,340 SF

B3:

- Four-bedroom unit
- Three stories
- 1,920 SF

UTILITY CL

LIVING ROOM

LAUNDRY
W

POWDER RM

KITCHEN

STAIR

UP

DINING ROOM

12' - 6"

12' - 6"

39' - 0"

12' - 6"

18' - 0"

B1 — First Floor

B1 — Second Floor (2-bed)

Labels in B1 floor plan:
- PRIMARY BEDROOM
- DN
- STAIR
- PRIMARY BATH
- LINEN CL
- BATH 1
- STORAGE CL
- CL
- UP
- HALLWAY / STUDY
- BEDROOM 1
- 12' - 0"
- 7' - 4 1/2"
- 5' - 4 1/2"
- 2' - 4 1/2"
- 10' - 4 1/2"
- 39' - 0"
- 6' - 4 1/2"
- 10' - 1 1/2"
- 18' - 0"

B2 — Third Floor (4-bed)

Labels in B2 floor plan:
- BALCONY
- OFFICE
- BEDROOM 2
- DN
- STAIR
- HALLWAY
- CL
- BATH 3
- CL
- CL
- BEDROOM 3
- 5' - 4 1/2"
- 11' - 7 1/2"
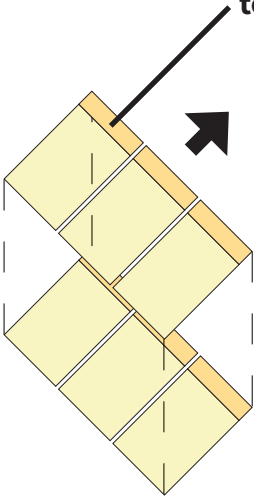- 2' - 4 1/2"
- 5' - 4 1/2"
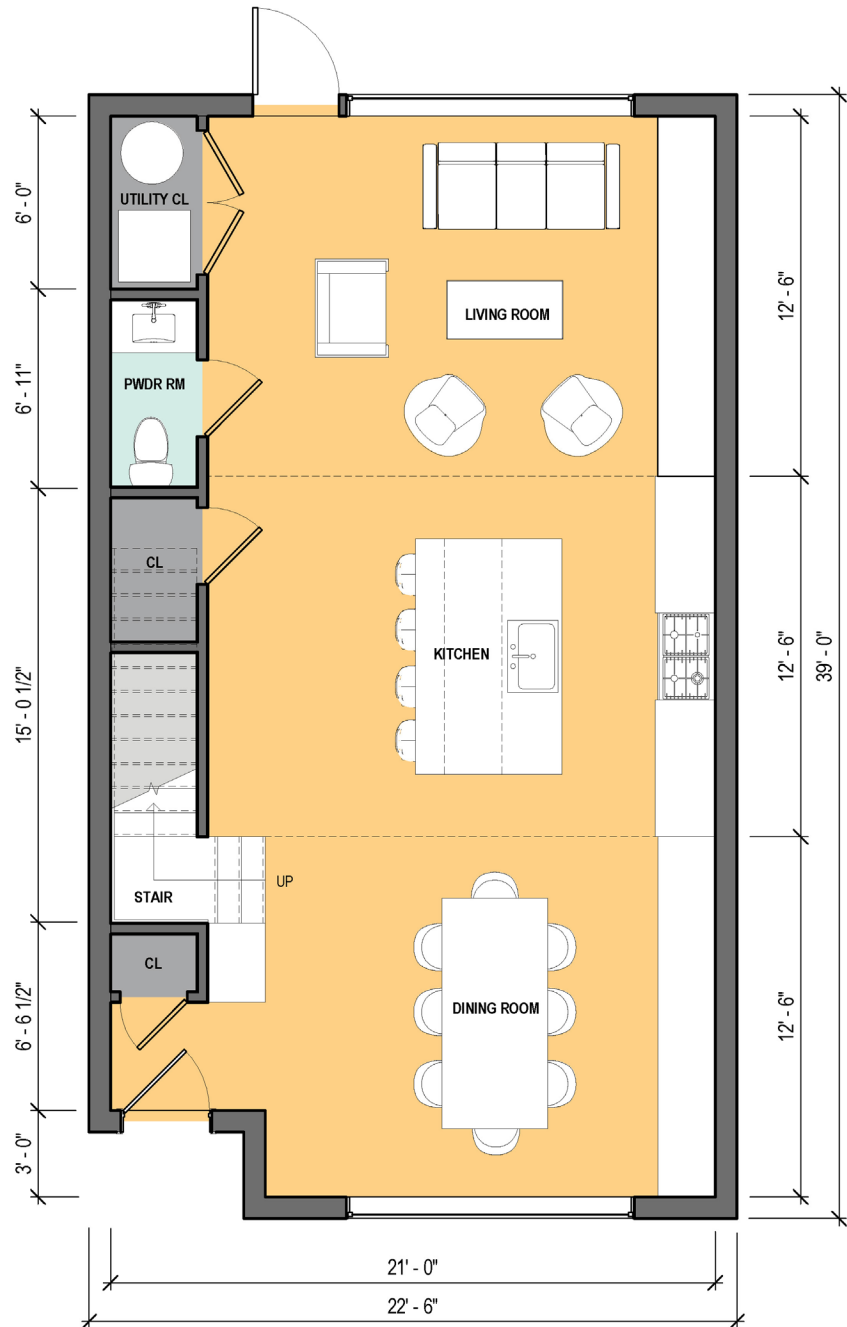- 2' - 4 1/2"
- 10' - 4 1/2"
- 33' - 7 1/2"
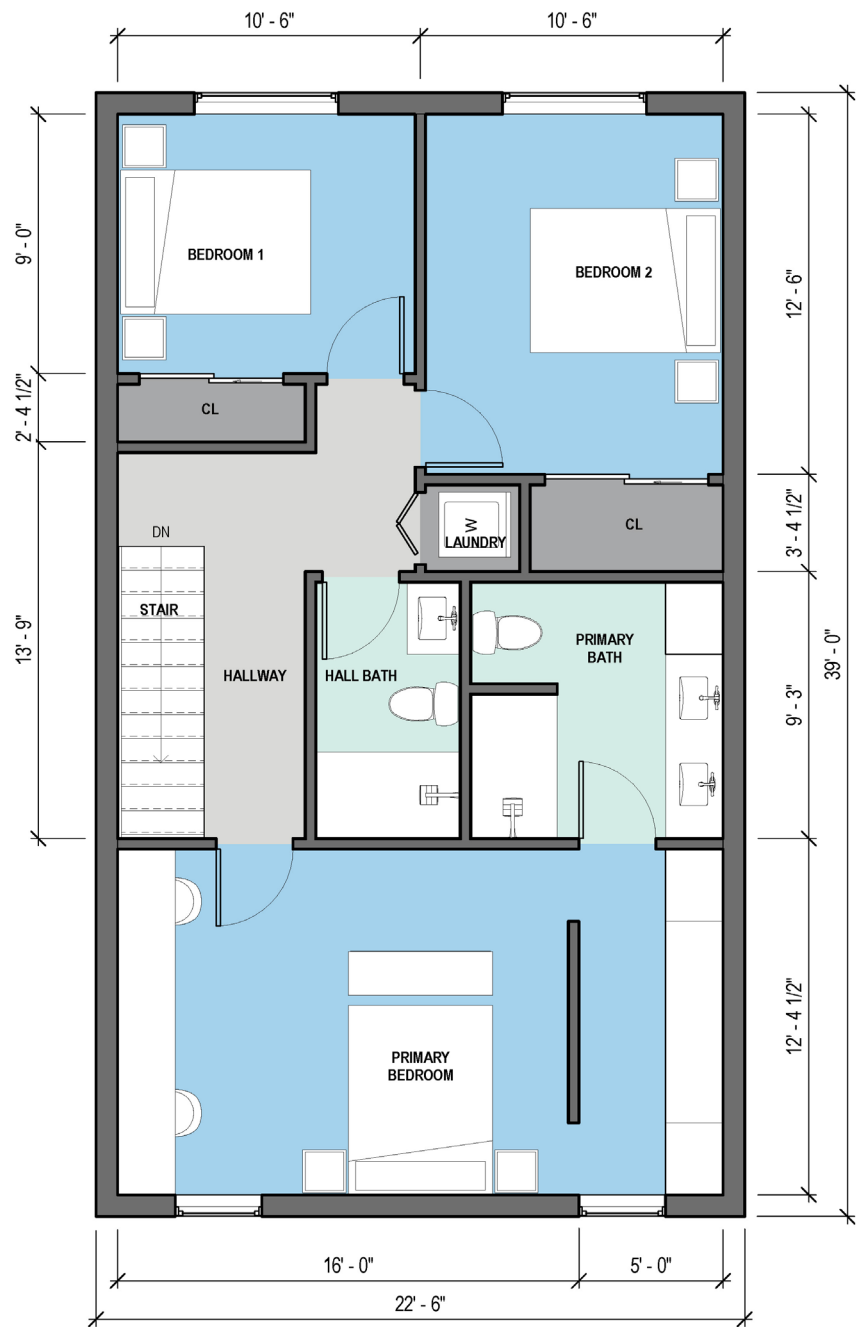- 18' - 0"
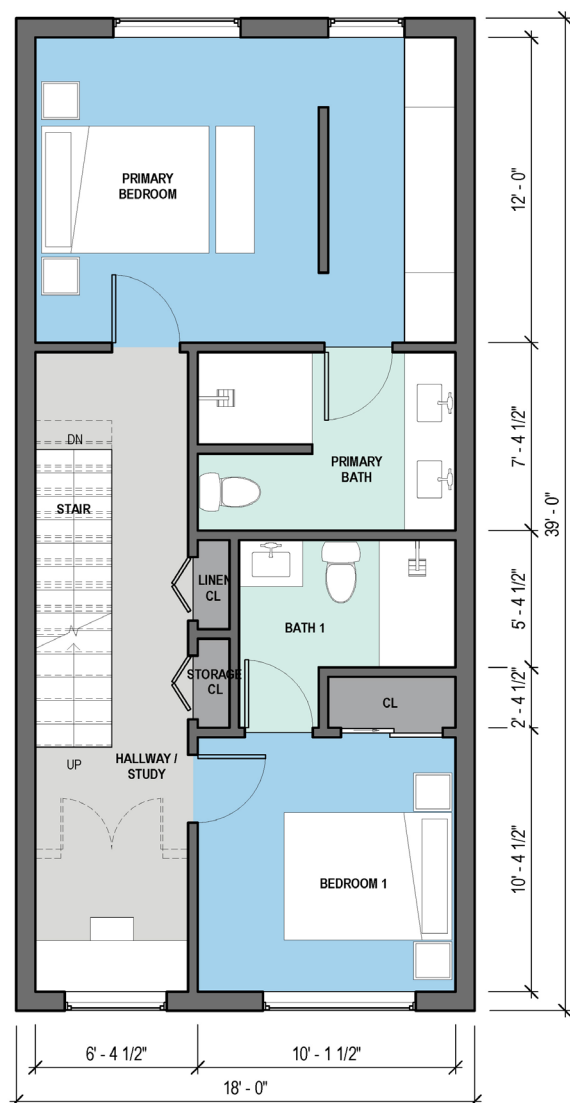
Basic Type 2 — B2

This type can be paired with others to create town homes

- This unit type is wider and can accommodate two bedrooms side-by-side and provide a three-bedroom unit within two stories.
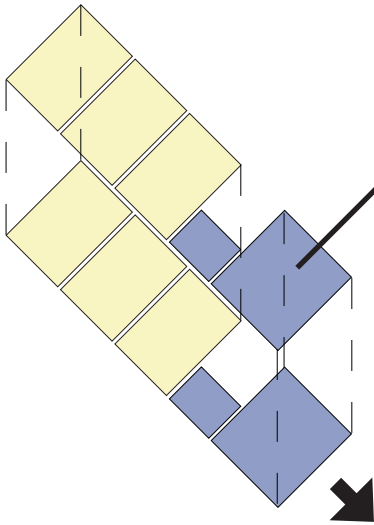
- Three-bedroom unit

- Two stories

- 1,660 SF

UTILITY CL

6' - 0"

PWDR RM

6' - 11"

LIVING ROOM

12' - 6"

CL

15' - 0 1/2"

KITCHEN

12' - 6"

39' - 0"

STAIR

UP

6' - 6 1/2"

CL

DINING ROOM

12' - 6"

3' - 0"

21' - 0"

22' - 6"

First Floor

The Missing Middle

10' - 6"   10' - 6"

9' - 0"

BEDROOM 1

BEDROOM 2

12' - 6"

2 - 4 1/2"

CL

CL

3 - 4 1/2"

DN

LAUNDRY

39' - 0"

STAIR

13' - 9"

HALLWAY   HALL BATH

PRIMARY
BATH

9' - 3"

PRIMARY
BEDROOM

12' - 4 1/2"

16' - 0"   5' - 0"
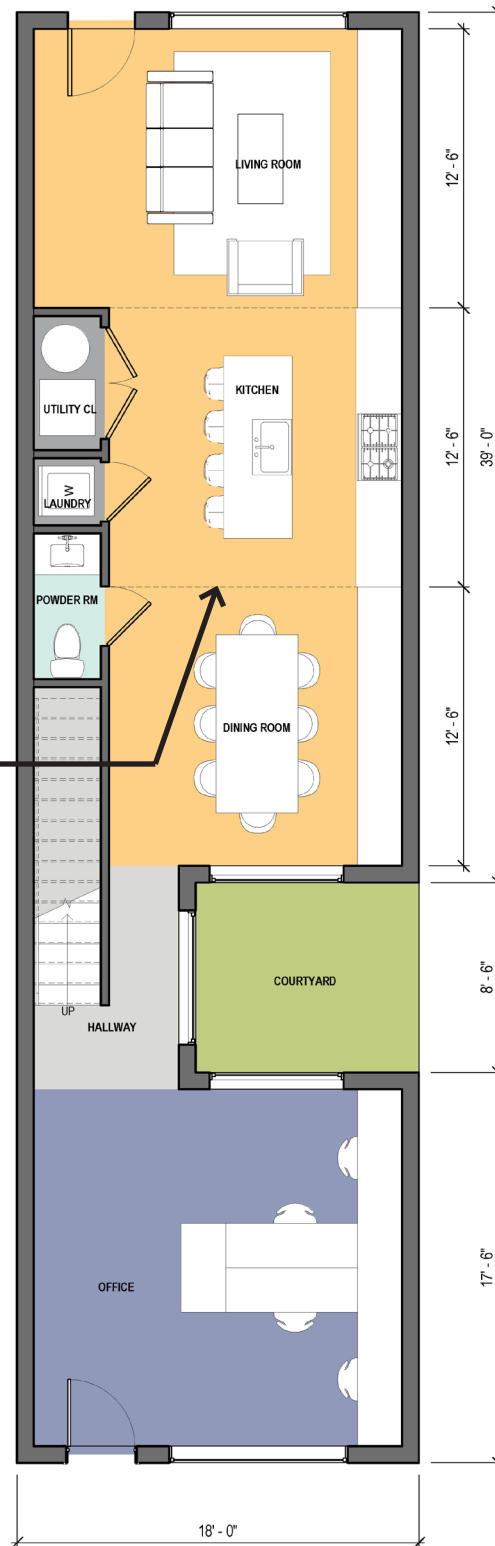
22' - 6"

Second Floor
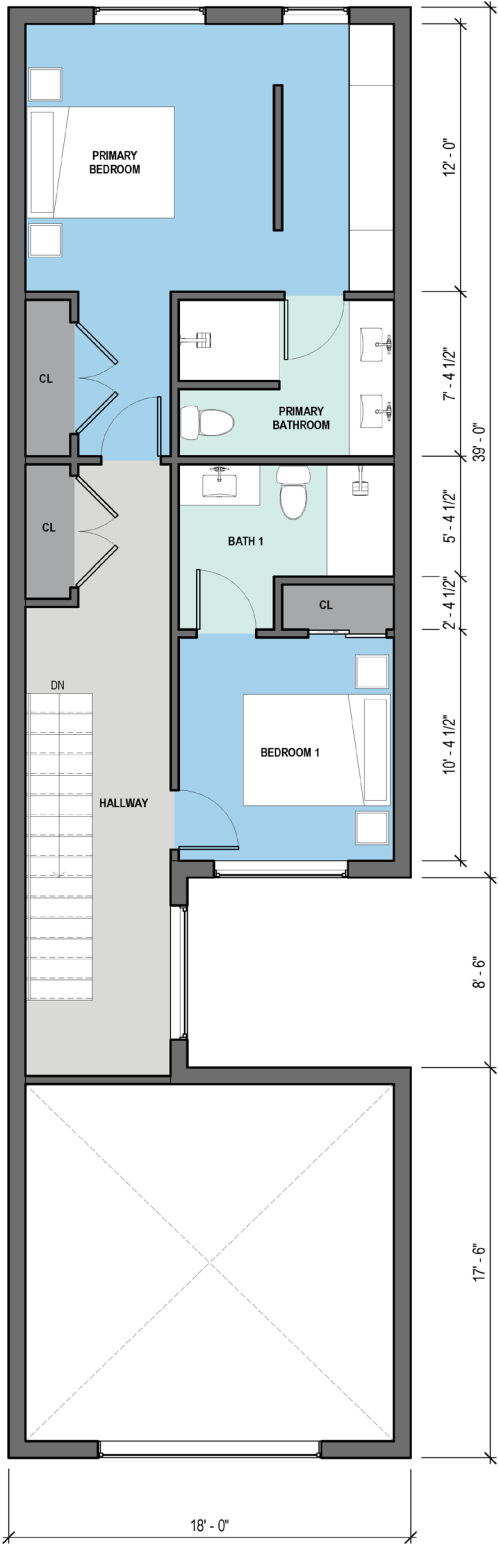
Live/Work Unit — S1

Office space can be added to the front (or rear) of the residence to create true live/work units

By adding a partition or curtain between Dining and Kitchen, the Dining Room can multi-function as a conference room or office space

- Two-bedroom unit + office space
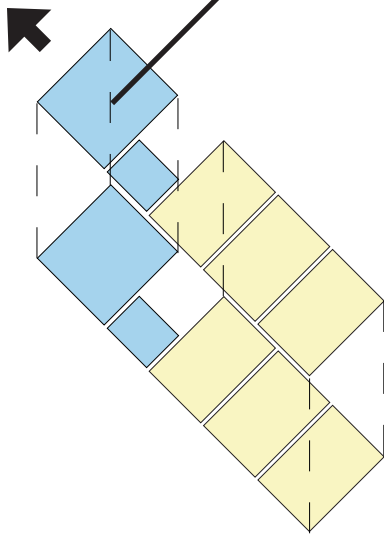- Two stories
- Living: 1,340 SF
- Working: 440 SF

LIVING ROOM

UTILITY CL

KITCHEN

LAUNDRY

POWDER RM

DINING ROOM

COURTYARD

UP

HALLWAY

OFFICE

12' - 6"

12' - 6"

12' - 6"

8' - 6"

17' - 6"

39' - 0"

18' - 0"

First Floor

PRIMARY
BEDROOM

CL

PRIMARY
BATHROOM

CL

BATH 1

CL

DN

BEDROOM 1

HALLWAY

12' - 0"

7' - 4 1/2"

39' - 0"

5' - 4 1/2"

2' - 4 1/2"

10' - 4 1/2"

8' - 6"

17' - 6"

18' - 0"

Second Floor

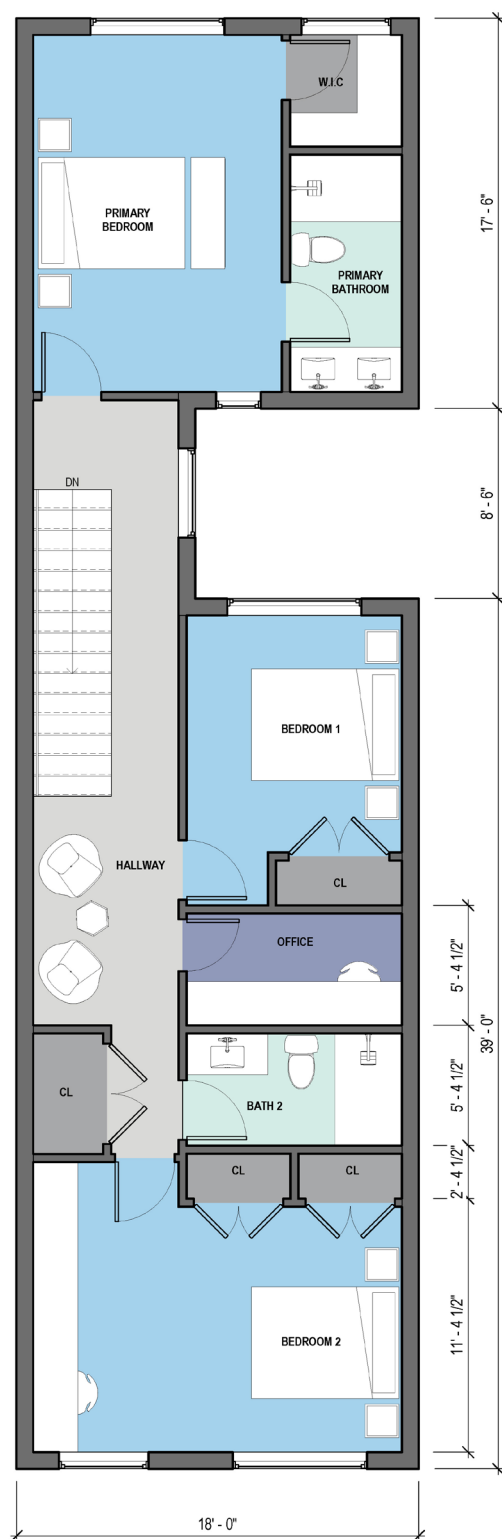# Multi-Generational — S2

GARC

An in-law suite can be added to the first floor to create a multi-generational unit

- Three-bedroom unit + first floor in-law suite
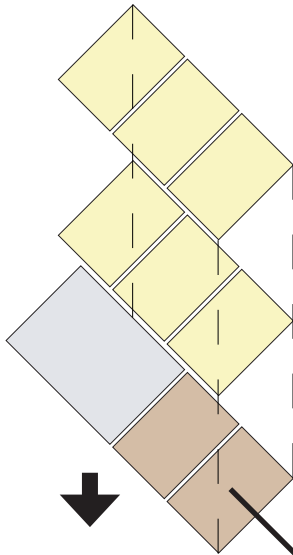- Two stories
- Main Unit: 1,340 SF
- In-law suite: 720 SF

First Floor

W.I.C

PRIMARY
BEDROOM

PRIMARY
BATHROOM

17' - 6"

DN

8' - 6"

BEDROOM 1

HALLWAY

CL

OFFICE

5' - 4 1/2"

39' - 0"

CL

BATH 2

5' - 4 1/2"

CL

CL

2' - 4 1/2"
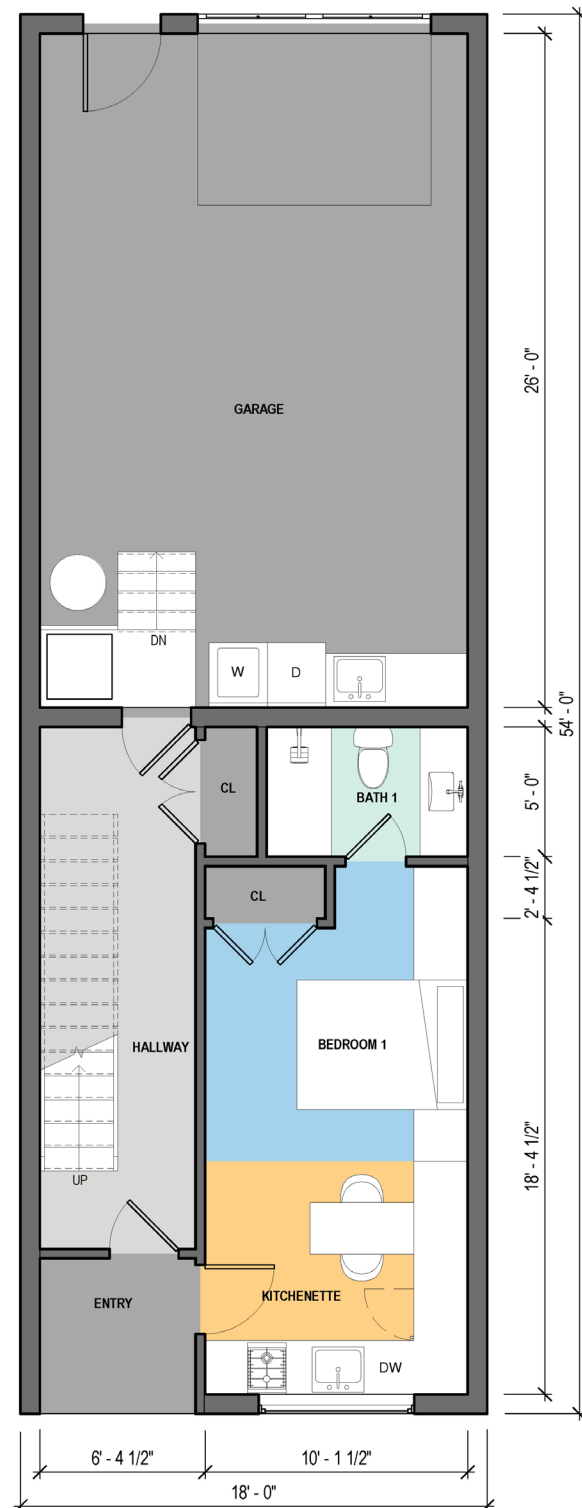
BEDROOM 2

11' - 4 1/2"

18' - 0"

Second Floor
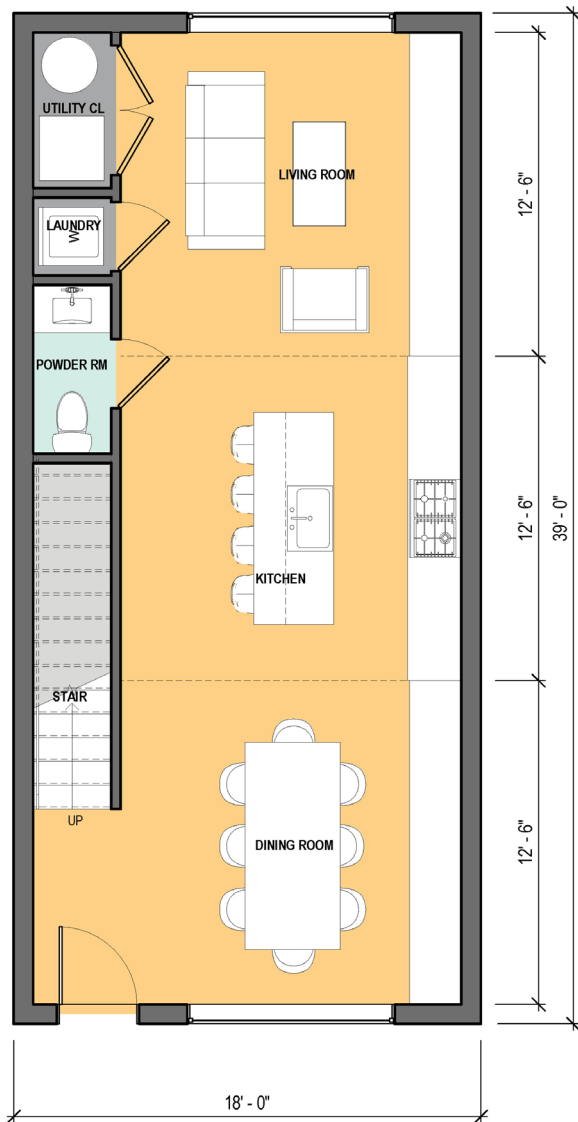
Garage + Accessory Dwelling Unit — S3

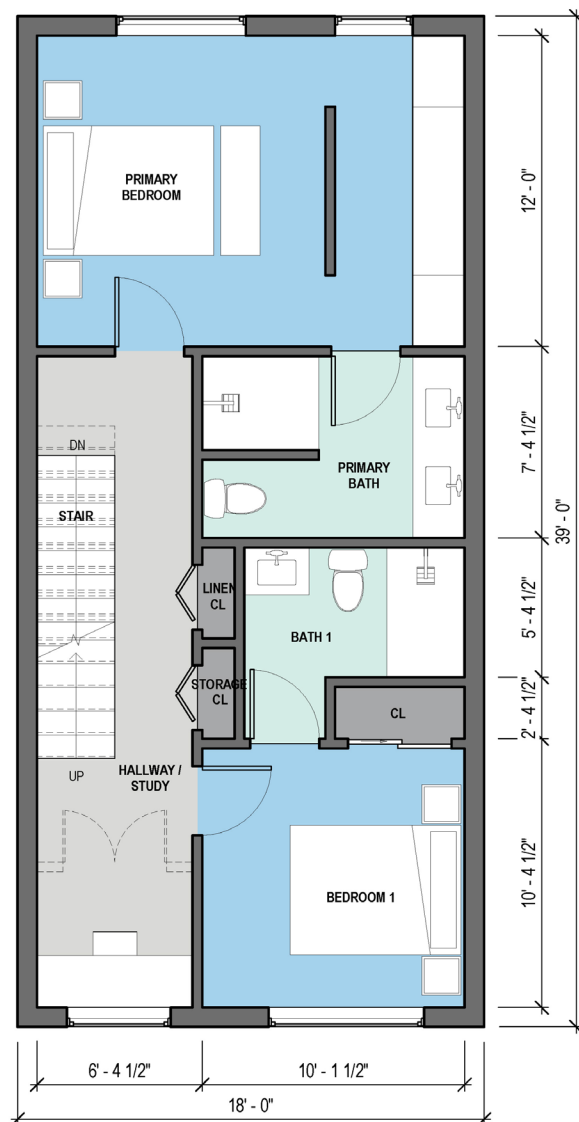**A Garage and small studio apartment can be added to the first floor as an accessory dwelling unit (ADU)**

- Two-bedroom unit with garage + ADU

- Three stories

- Main Unit: 1,520 SF

- Garage: 460 SF

- ADU: 290 SF

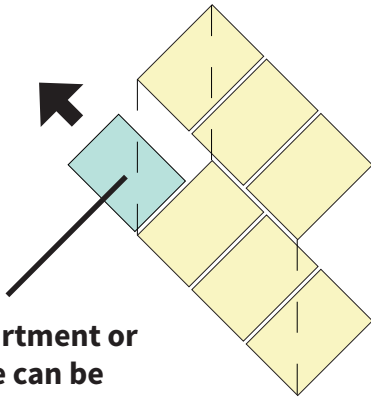GARAGE

DN

W   D

CL

BATH 1

CL

HALLWAY

BEDROOM 1

UP

ENTRY

KITCHENETTE

DW

26' - 0"

54' - 0"

5' - 0"

2' - 4 1/2"

18' - 4 1/2"

6' - 4 1/2"

10' - 1 1/2"

18' - 0"

First Floor

Second Floor (Same as B1)

UTILITY CL

LIVING ROOM

LAUNDRY

POWDER RM

KITCHEN

STAIR

UP

DINING ROOM

12' - 6"

12' - 6"

12' - 6"

39' - 0"

18' - 0"

Third Floor (Same as B1)

PRIMARY BEDROOM

DN

STAIR

PRIMARY BATH

LINEN CL

BATH 1

STORAGE CL

CL

UP

HALLWAY / STUDY

BEDROOM 1

12' - 0"

7' - 4 1/2"

5' - 4 1/2"

2' - 4 1/2"

10' - 4 1/2"

39' - 0"

6' - 4 1/2"

10' - 1 1/2"

18' - 0"

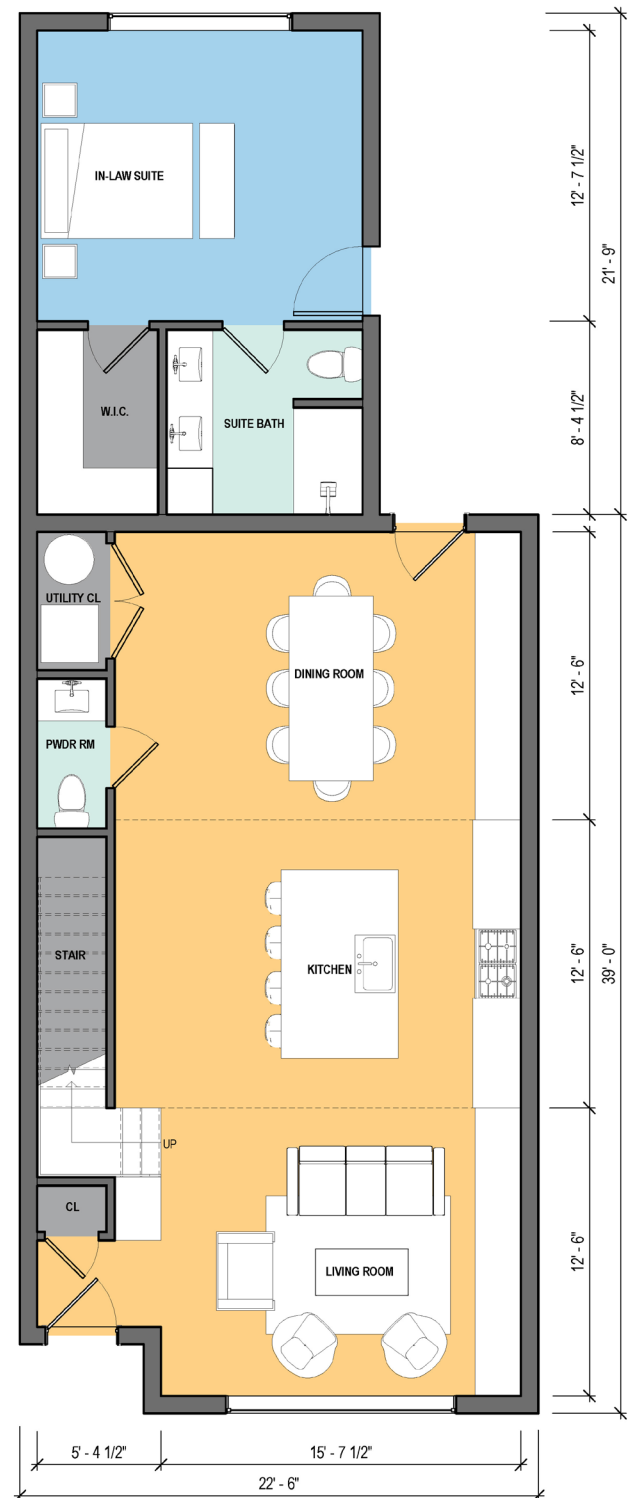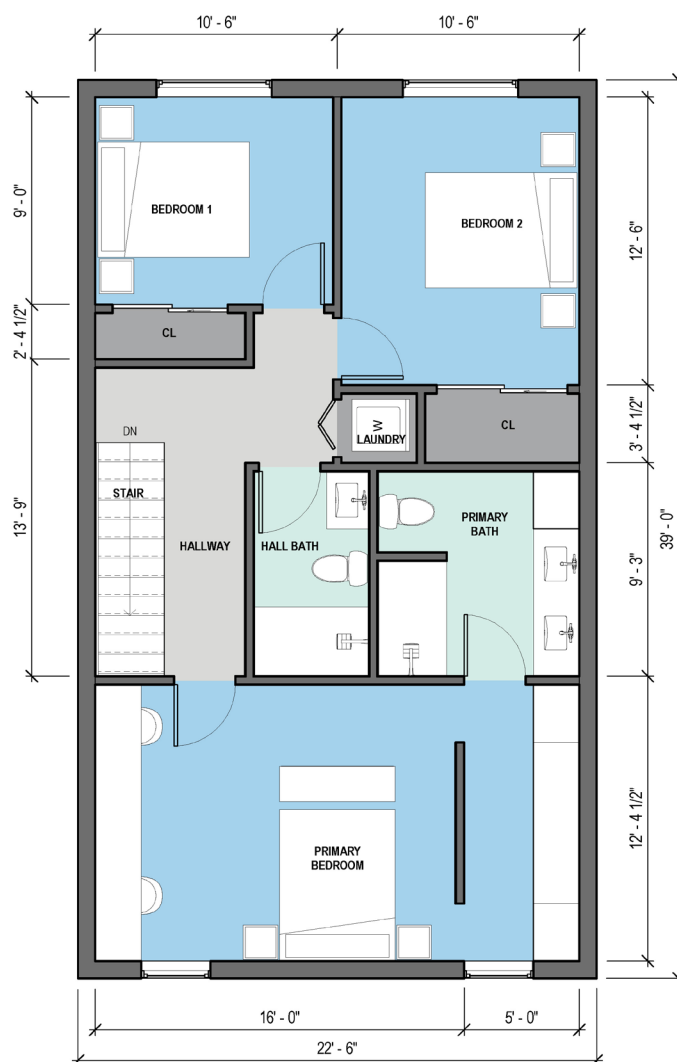# Expandable — S4

A small apartment or
in-law suite can be
added to the first floor
for future expansion

- Three-bedroom unit +
  in-law suite
- Two stories
- Main Unit: 1,660 SF
- In-law suite: 330 SF

IN-LAW SUITE

W.I.C.

SUITE BATH

UTILITY CL

DINING ROOM

PWDR RM

KITCHEN

STAIR

UP

CL

LIVING ROOM

12' - 7 1/2"

21' - 9"

8' - 4 1/2"

12' - 6"

12' - 6"

39' - 0"

12' - 6"

5' - 4 1/2"

15' - 7 1/2"

22' - 6"

First Floor

Second Floor (Same as B3)

10' - 6" 10' - 6"

9' - 0"
2' - 4 1/2"
13' - 9"
12' - 6"
3' - 4 1/2"
9' - 3"
12' - 4 1/2"
39' - 0"

BEDROOM 1

BEDROOM 2

CL

DN

W
LAUNDRY

CL

STAIR

HALLWAY

HALL BATH

PRIMARY
BATH

PRIMARY
BEDROOM

16' - 0" 5' - 0"

22' - 6"

Flexible Combination of Unit Type Family

B1 + B2

S4 + B1 + B1

The Missing Middle

S2 + B1 + B1 + S2

Study Sketch

Street View

Basic Type — **Traditional Style**

Study Sketch

Street View

Study Sketch

Street View

Study Sketch

Street View

Study Sketch

Street View

Fourplex — Traditional and Coastal Character District
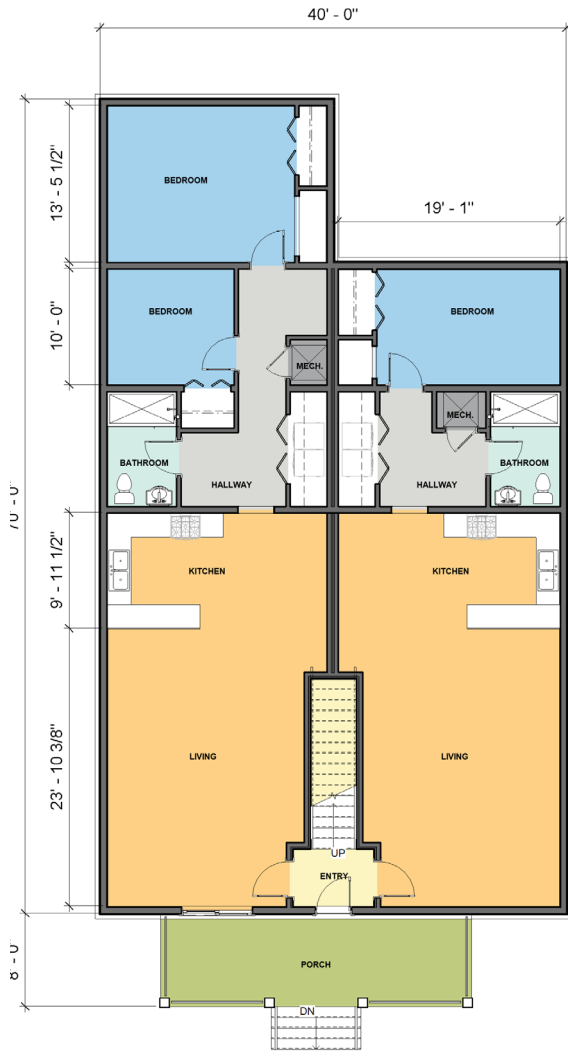
First Floor

Second Floor

Dills Architects studied existing homes in established Norfolk neighborhoods to determine appropriate scale, massing, height, and land use patterns, as well as details and materials such as porches, rooflines, windows and doors. Next, we selected vacant lots in different Character Districts, determined current Zoning Codes, and designed Prototype Floor Plans to fit these sites.

The Prototype Plans are composed with only two different Living Unit plans; one for narrow lots, and another that might better fit lots with wider street frontages. While the Living Spaces remain the same, the number of bedrooms in any unit is a variable, depending on lot size and market demand. Care was taken to design with only one entrance door per street frontage, to better integrate into existing single-family neighborhoods.

The two Prototype floor plans can be combined in many configurations, to fit various sites and numbers of units per building, and to allow for rich exterior massing while giving builders the ability to construct familiar living units and control costs.
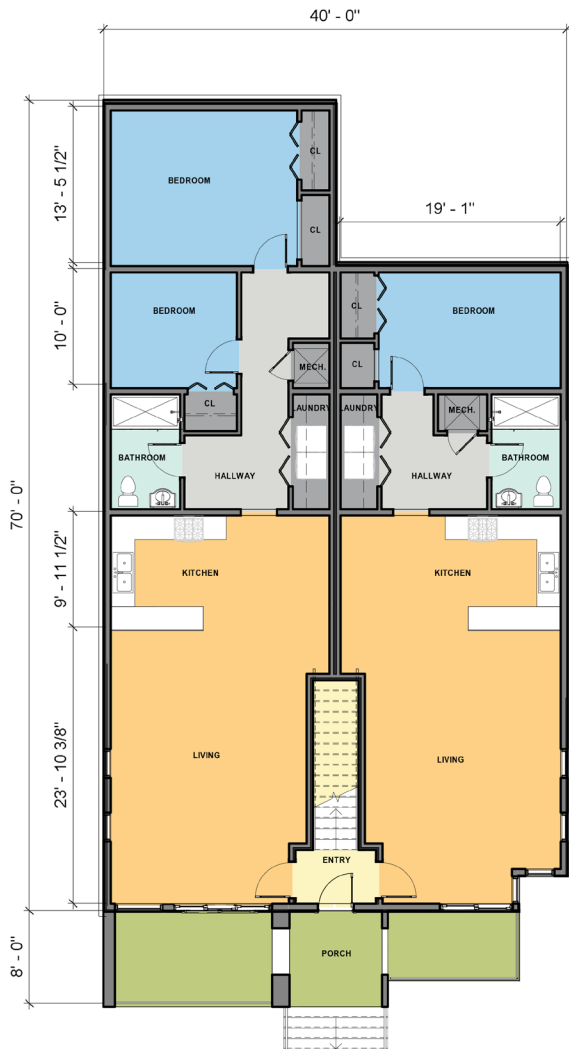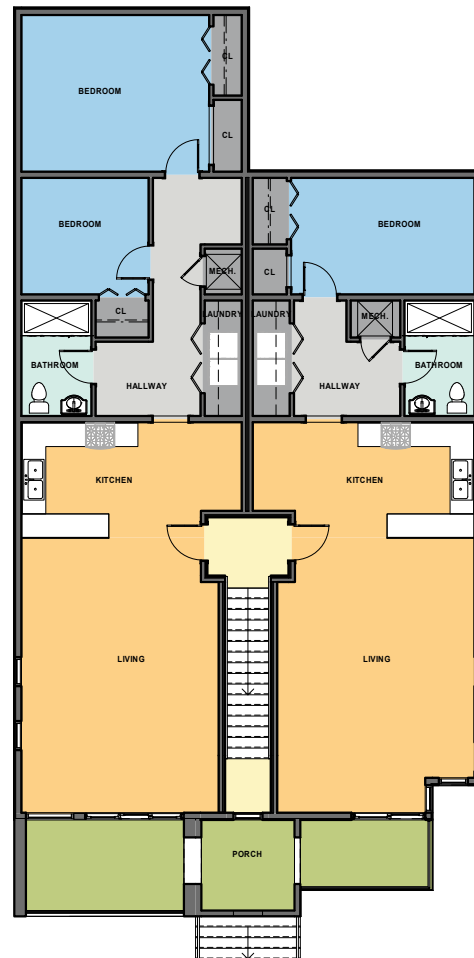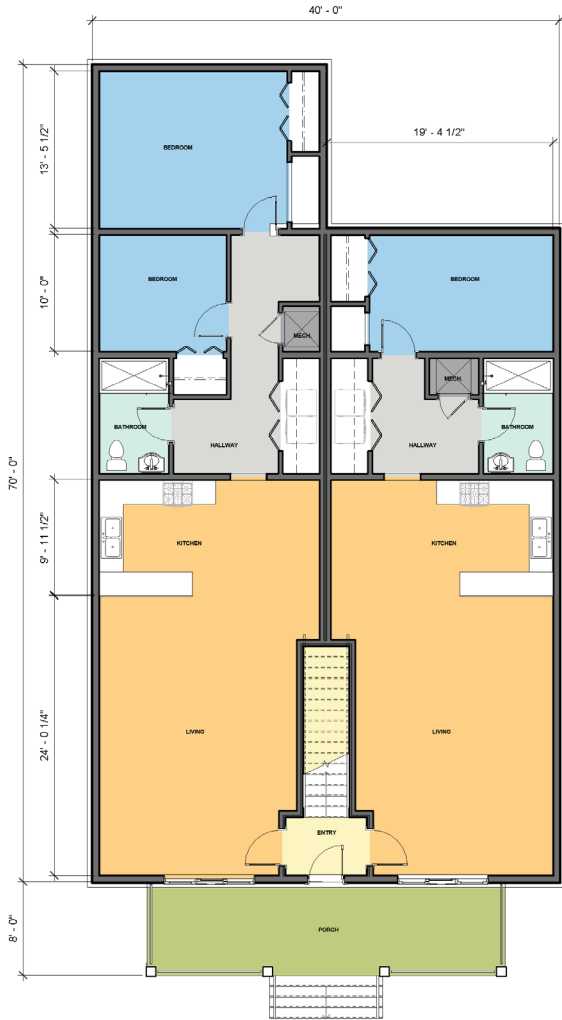
- Four units, stacked, and side-by-side.
- First Floor: one 1-bedroom unit, one 2-bedroom unit, one bath.
- Second Floor: one 1-bedroom unit, one 2-bedroom unit.
- One door on Street Elevation
- Covered Porch space accessible to all units.
- One Bedroom Units 1,160SF
- Two Bedroom Units: 1,400SF

DA Dills Architects

City of Norfolk

The Missing Middle

Fourplex — Contemporary Design
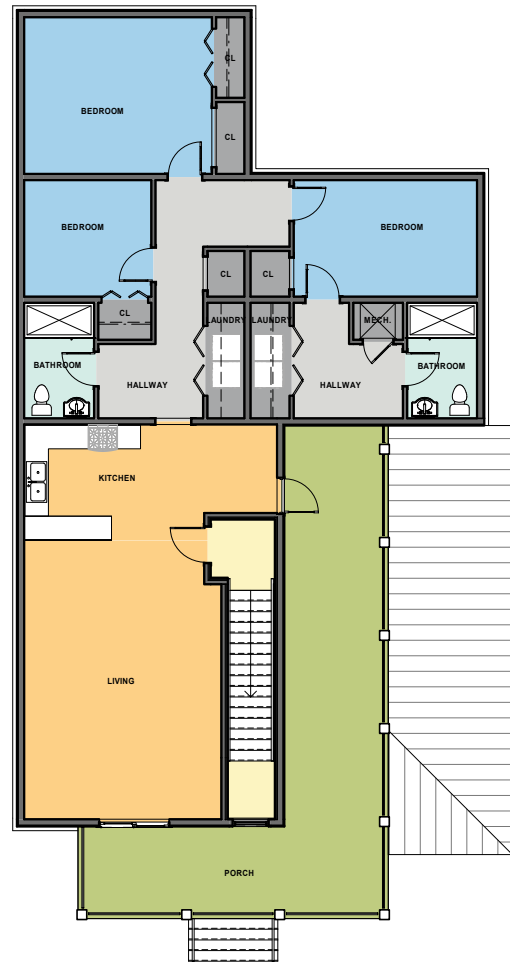
First Floor

Second Floor

- Four units, stacked, and side-by-side.

- First Floor: one 1-bedroom unit, one 2-bedroom unit, one bath.

- Second Floor: one 1-bedroom unit, one 2-bedroom unit.

- One door on Street Elevation

- Covered Porch space accessible to all units.

- One Bedroom Units 1,160SF

- Two Bedroom Units: 1,400SF

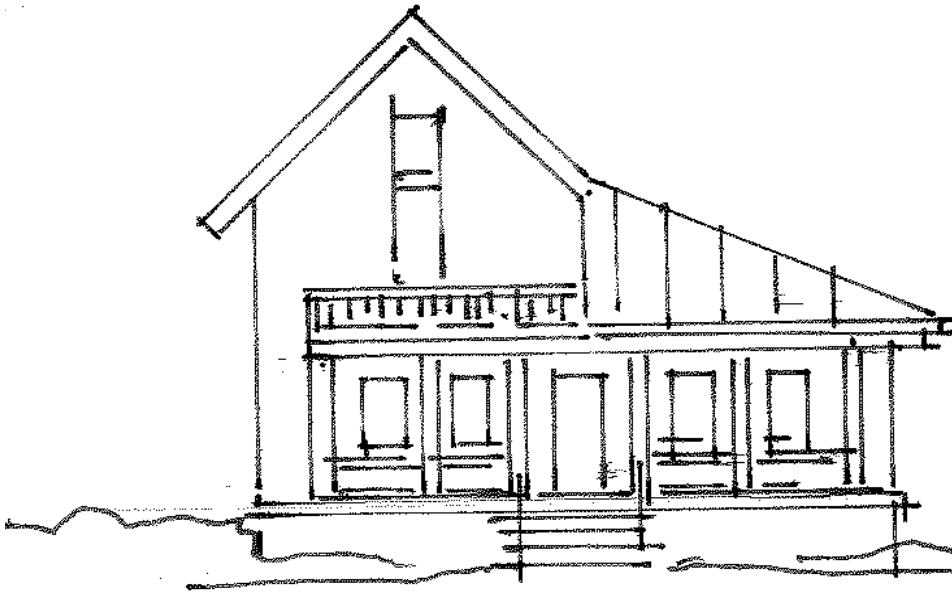The Missing Middle

Triplex — **Contemporary Design**
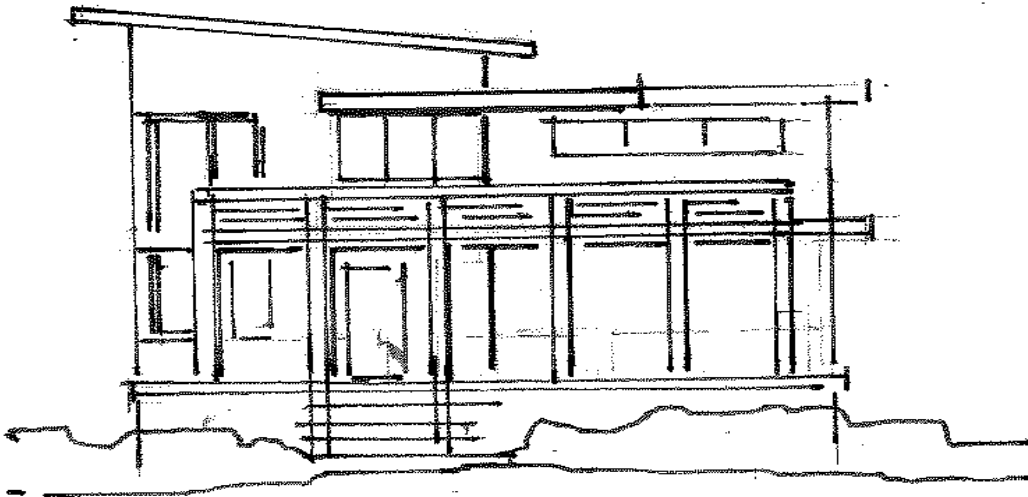
First Floor

Second Floor

- Three units, stacked, and side-by-side.

- First Floor: one 1-bedroom unit, one 2-bedroom unit, one bath.

- Second Floor: one 3-bedroom unit, 2 baths.

- One door on Street Elevation

- Covered Porch space accessible to all units.

- One Bedroom Unit: 1,120SF

- Two Bedroom Unit: 1,400SF

- Three Bedroom Unit: 1,840SF
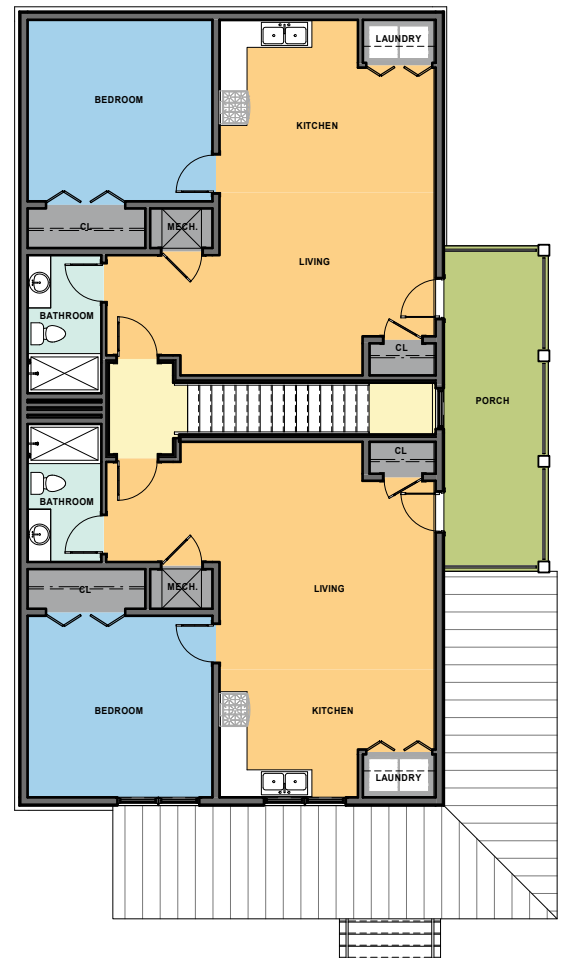
TRIPLEX PLAN A-3
TRADITIONAL CHARACTER

TRIPLEX PLAN A-3
SUBURBAN/COASTAL CHARACTER

The Missing Middle
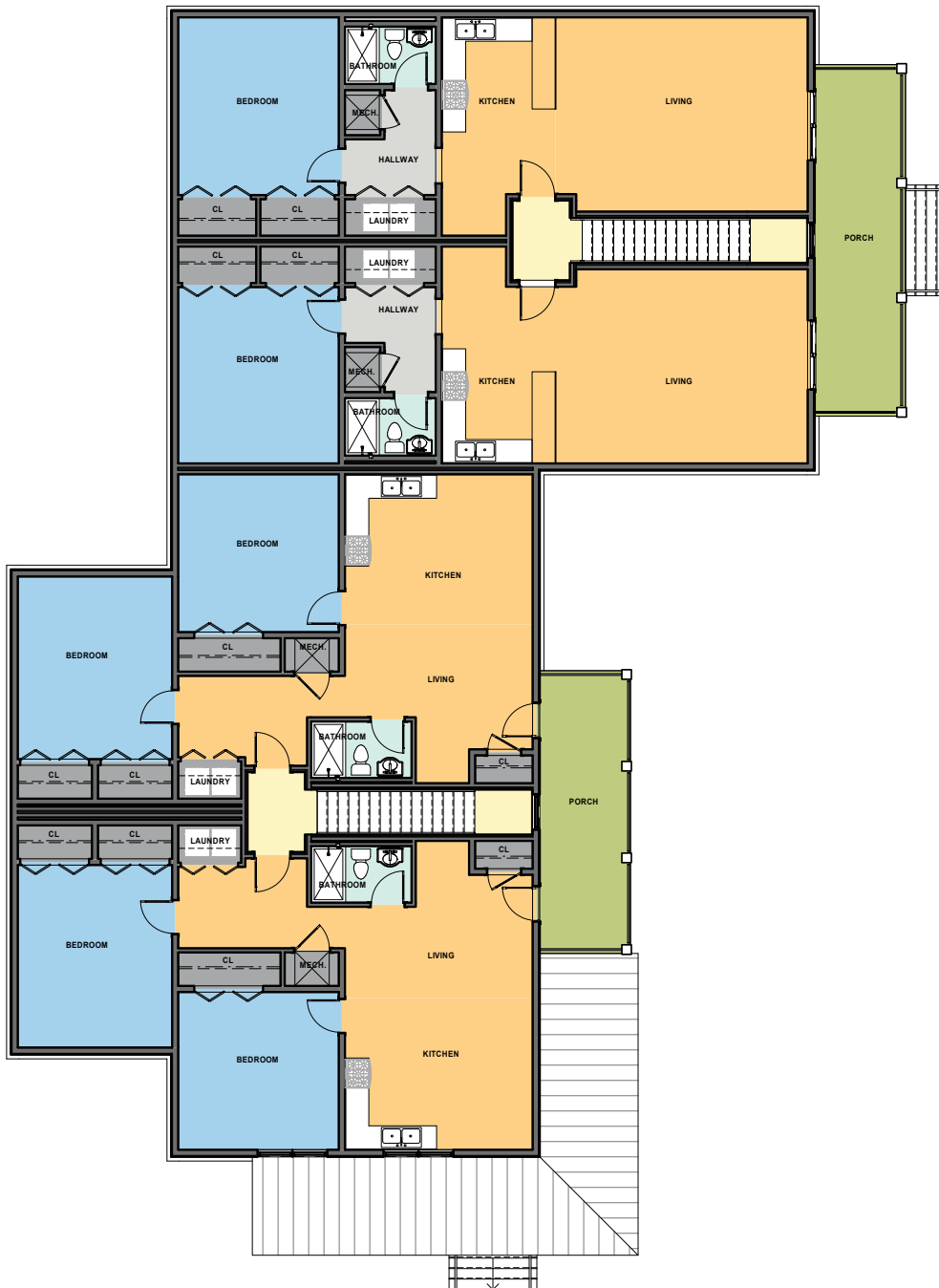
Fourplex

First Floor

Second Floor

- Four units, stacked, and front-to-back.
- First Floor: two 1-bedroom units, one bath.
- Second Floor: two 1-bedroom units, one bath.
- One door on Street Elevation
- Covered Porch space accessible to all units.
- One Bedroom Units 925SF

Eightplex

First Floor

- Eight units, stacked, and front-to-back.

- First Floor: two 1-bedroom units, one bath.

- Second Floor: two 1-bedroom units, one bath.

- Works for corner lots; one door on front Street Elevation, 3 doors on side street elevation.

- Covered Porch space accessible to all units.

- Four 2-bedroom units on each floor, 1,600SF each.

Second Floor

BEDROOM

BATHROOM

MECH.

KITCHEN

LIVING

HALLWAY

CL

CL

LAUNDRY

PORCH

CL

CL

LAUNDRY

HALLWAY

MECH.

KITCHEN

BATHROOM

LIVING

BEDROOM

BEDROOM

KITCHEN

CL

MECH.

LIVING

BEDROOM

BATHROOM

CL

PORCH

CL

CL

LAUNDRY

CL

LAUNDRY

BATHROOM

CL

BEDROOM

CL

MECH.

LIVING

BEDROOM

KITCHEN

Resilient Construction & Sustainable Design

Resilient Construction & Sustainable Design

ACCESSIBILITY — ADA & UNIVERSAL DESIGN

Designing for accessibility ensures that buildings are usable throughout the life of the occupant. Buildings must be designed and constructed in accordance with ADA Guidelines. They should also be designed to allow occupants to recover from injuries, age gracefully, or enjoy visits from friends and family with disabilities.

TOTAL COST OF OWNERSHIP — INSULATION

Effective insulation installation at the time of construction is one of the best ways to decrease the cost of ownership or tenancy for occupants of the building by reducing their monthly energy costs. All buildings should be framed with a minimum of 6 inch exterior wall framing to provide a cavity deep enough for effective insulation. Roof framing should be a minimum of 12 inches deep for insulation and an air gap at the underside of the roof sheathing. Insulating elevated slabs, foundation walls, or the underside of the lowest floor, depending on the foundation type, also provide significant energy savings to the building occupants.

TOTAL COST OF OWNERSHIP — SOLAR

There are two ways to decrease cost of ownership when it comes to solar power:

1.   Install solar panels at the time of construction. With the right sized system, solar power can reduce electricity costs for the occupants, and potentially pay back the owner for excess energy sold to the electric utility company. Additionally, solar power can be an effective form of resilience should the electrical service be disrupted for an extended period of time due to storms or other outages.

2.   Pre-wire the building for the installation of solar power at a later date. This is a very inexpensive step to take during construction, but can be prohibitively expensive to install after the building is completed and occupied. If a solar power system is not affordable at the time of construction, it can be added on to the building later, but will be less expensive to install.

Solar panels installed on a duplex

FLOOD RESISTANCE — ELEVATION

The most effective means of flood protection is elevating living spaces out of the flood plain. While all designated flood plains have a specific minimum elevation requirement, the majority of flood damage occurs in places which are not in a designated flood plain. For this reason, all residential buildings in Norfolk must be elevated a minimum amount regardless of whether or not they are located in a flood plain.

FLOOD RESISTANCE — RETENTION

Providing a rainwater storage on individual properties reduces the risk of flood damage in the entire City of Norfolk. Storing rainwater reduces the amount that the city's pipes need to drain in the event of a storm. This stored water, depending on the containment method, can then be used to water plants or wash vehicles, reducing the amount of city water used on each property.

Additionally, the City of Norfolk Public Works Department may offer a reduction in storm water fees as an incentive. For more information on rain capture, contact the Public Works Department.

Types of storm water retention include:

1. **Tree Planting:** Trees absorb groundwater and release it into the atmosphere, reducing the risk of flooding. A mature oak, for example, can store upwards of 200 gallons (6+ bathtubs) daily. It is important to not damage mature trees during the construction process so that they can absorb water and cleanse the air.

2. **Rain Barrel or Cistern storage:** Providing a Rain Barrel or a Cistern (container larger than a rain barrel) will allow homeowners to use rainwater instead of city water for certain tasks. Rainwater is not as filtered, so tasks should be limited to washing appropriate items or watering plants.

3. **Rain Garden:** A Rain Garden is a miniature version of tree planting, absorbing water that may otherwise flood the property. A rain garden is a collection of plants that can absorb water and beautify a yard. Each property is a unique case, and a professional should be consulted to ensure the correct species of plants are selected.

Rain barrel connected to a downspout

Rain garden planted to collect storm water. The stones in the foreground slow the water as it enters the garden to prevent it from washing soil away.

Approved
Materials & Finishes

Allowable Materials — Approved for Long-Term Durability

NOTE: Below are approved materials for the following categories, with examples shown on pgs. 73–77.

ROOFING

Pitched roofs:

- Slate and manufactured slate, asphalt or fiberglass composition shingle, standing seam metal, smooth photovoltaic shingle, wood shingle

Flat roofs:

- TPO, PVC, or rubber light colored membrane

Occupied Roof:

- Wood or composite decking

- Concrete, ceramic, composite, or stone tile decking

GUTTERS AND DOWNSPOUTS

- Half-round, ogee, or square profile with round or rectangular downspouts formed of copper or painted or pre-finished metal

SOFFITS

- Smooth-finish wood or fiber-cement, or tongue-and-groove wood or composite plank

CLADDING

- Smooth-finish wood or fiber-cement lap siding with 4 to 8 inches of exposure

- Wood or fiber-cement shingle siding

- Wood, fiber-cement, or metal panel

- Modular size brick with smooth face in Running, Common, or Flemish bond patterns

- Stucco

TRIM

- Wood, composite, cellular PVC, or polyurethane millwork

FOUNDATIONS & CHIMNEYS

- Brick, brick veneer, or stucco

WINDOWS

- Painted wood, aluminum, aluminum-clad, vinyl-clad, fiberglass, ultrex

- True divided light or simulated divided light sash with exterior muntin profile (see window details for appropriate patterns)

DOORS

- Wood, fiberglass or steel with traditional stile-and-rail proportions and raised panel profiles, or simple modern profiles for modern buildings

SHUTTERS

- Wood or composite, operable or mounted with hardware to simulate operable, sized to cover window sash or door frame when closed

COLUMNS

- Wood, fiberglass, stone, or composite in profiles and sizes appropriate to building style.

- Steel or other metals also appropriate for modern buildings

RAILINGS

- Milled wood, composite, and cellular PVC top and bottom rails with turned or square balusters for traditional building styles

- Wood, metal, glass panels, cables, also appropriate for modern buildings

PORCH CEILINGS

- Plaster, tongue-and-groove wood or composite planks, or beaded plywood

FRONT YARD FENCES

- Wood picket, composite, cellular pvc brick pier, solid wrought iron or steel

## LIGHTING

- Porch ceiling or wall-mounted

Allowable Materials Examples — Approved for Long-Term Durability

NOTE: indicates material only; color is the decision of the individual owner/builder

ROOF

Architectural Shingles or Slate Shingles

Cement or Terra Cotta Shingles

Standing Seam

Solar Shingles

White or Light Gray Membrane (roof slopes less than 3:1 only)

Allowable Materials Examples — Approved for Long-Term Durability

NOTE: indicates material only; color is the decision of the individual owner/builder

GUTTERS & DOWNSPOUTS

Half-round shapes look best on traditional buildings; square gutters and downspouts work well for contemporary homes; avoid gutters with a faux-traditional profile

SOFFITS

Continuous soffit vents look best; avoid products that draw attention to vents

Allowable Materials Examples — Approved for Long-Term Durability

NOTE: indicates material only; color is the decision of the individual owner/builder

CLADDING/VENEER

The following materials may all be used together (for example, brick base with siding at the first floor and shingles at the second floor)
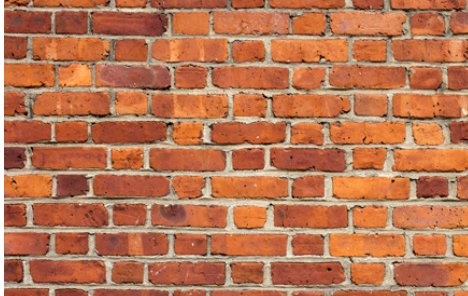
Brick

Painted Cementitious Siding/ Painted Cedar Siding

Cementitious Shingles or Painted Cedar Shingles
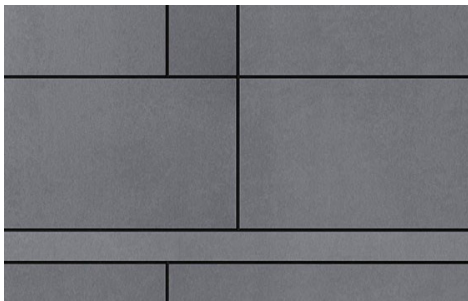
Cementitious Panels
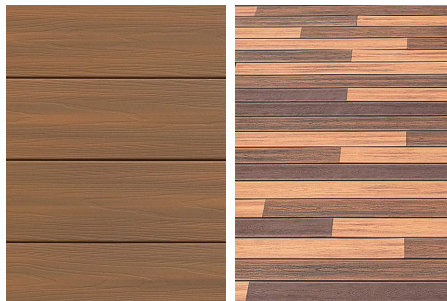
Simulated Wood Cementitious, Metal, or Composite Siding (in appropriate Character Districts)

BASE

Brick — must be used at the front porch base

Stucco/Parged finish — may be used around the remaining building perimeter
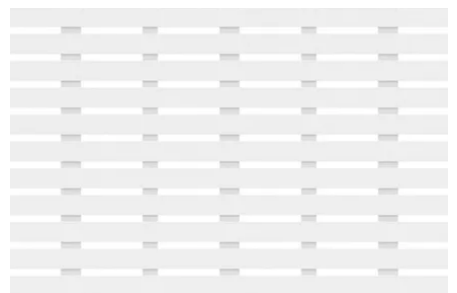
Composite Slat — may be used to create skirts around porches and other non-conditioned spaces
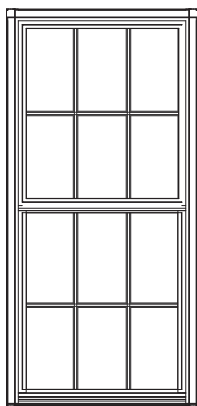
Window Types
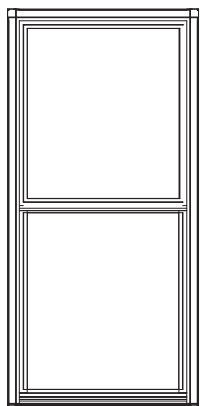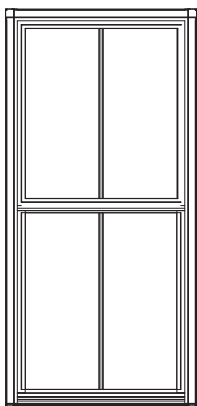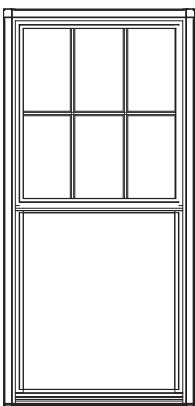
**1 over 1**   **2 over 2**   **6 over 1**   **6 over 6**

Brick lintel and sill made of stone, cast stone, concrete, or wood. Lintels should extend at least 4" beyond the edge of the masonry opening.

Brick lintels can be as simple as a single soldier course supported by a steel lintel behind. Other appropriate brick lintels include arches and jack arches. Brick sills are typically a single sloped rowlock.

Raised trim should surround windows in walls clad in siding.
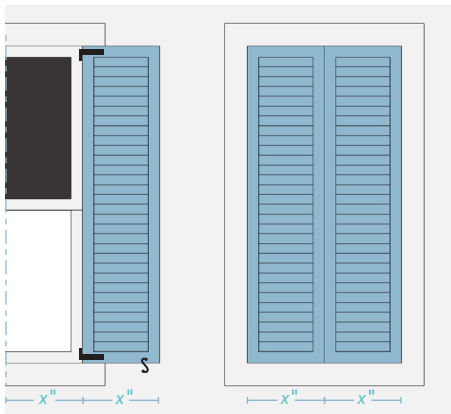
Shutters, fixed or operable, should align with the edge of the window frame, and be sized to cover half of the window opening. Shutter dogs hold shutters open against the wall.

Frame Opening Articulation

Masonry Opening Articulation

Flush Framing — Not Recommended

Window Types

ALLOWABLE WINDOW & DOOR MATERIALS

Wood, aluminum clad, vinyl clad, fiberglass, aluminum storefront, and steel sash
(Note: all vinyl windows are not allowed)

ALLOWABLE SHUTTER MATERIALS

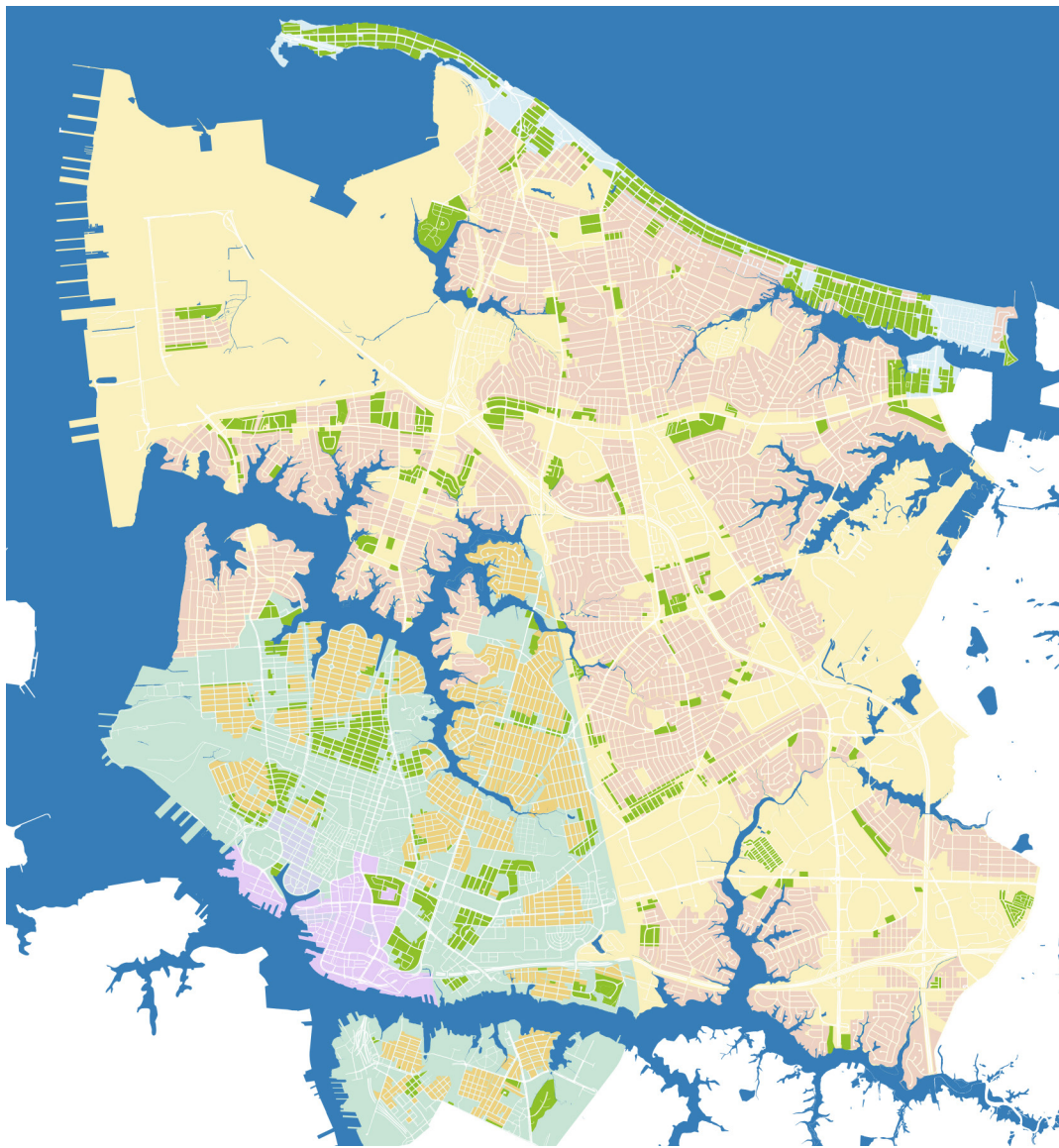Wood, composite
(Note: all vinyl shutters are not allowed)

Modern and contemporary designs should make use of contemporary windows such as aluminum and steel casement and awning windows.

Fully glazed corners with storefront-type systems, multi-unit sliders, and operable glass wall systems are appropriate for modern and contemporary missing middle buildings.
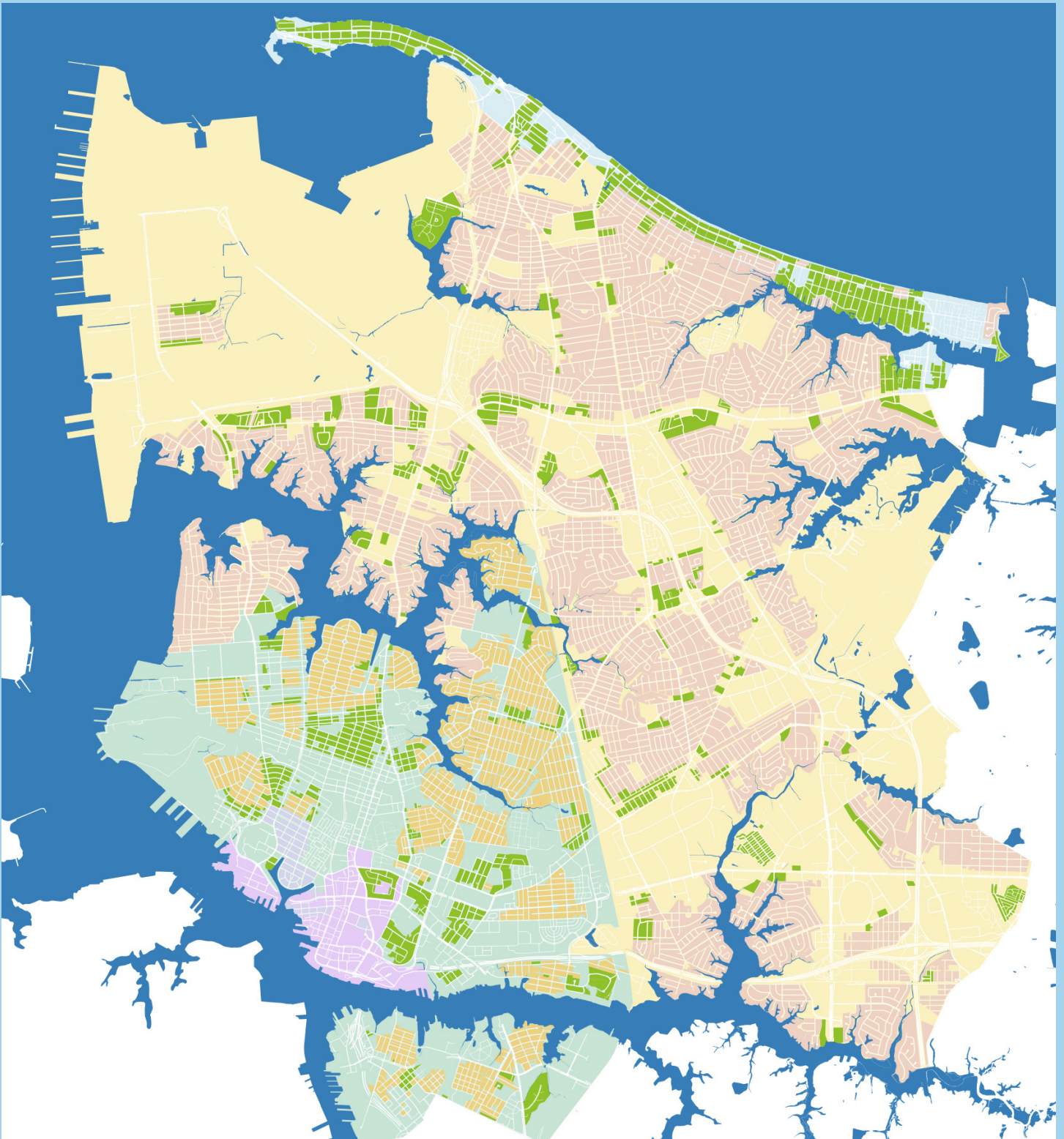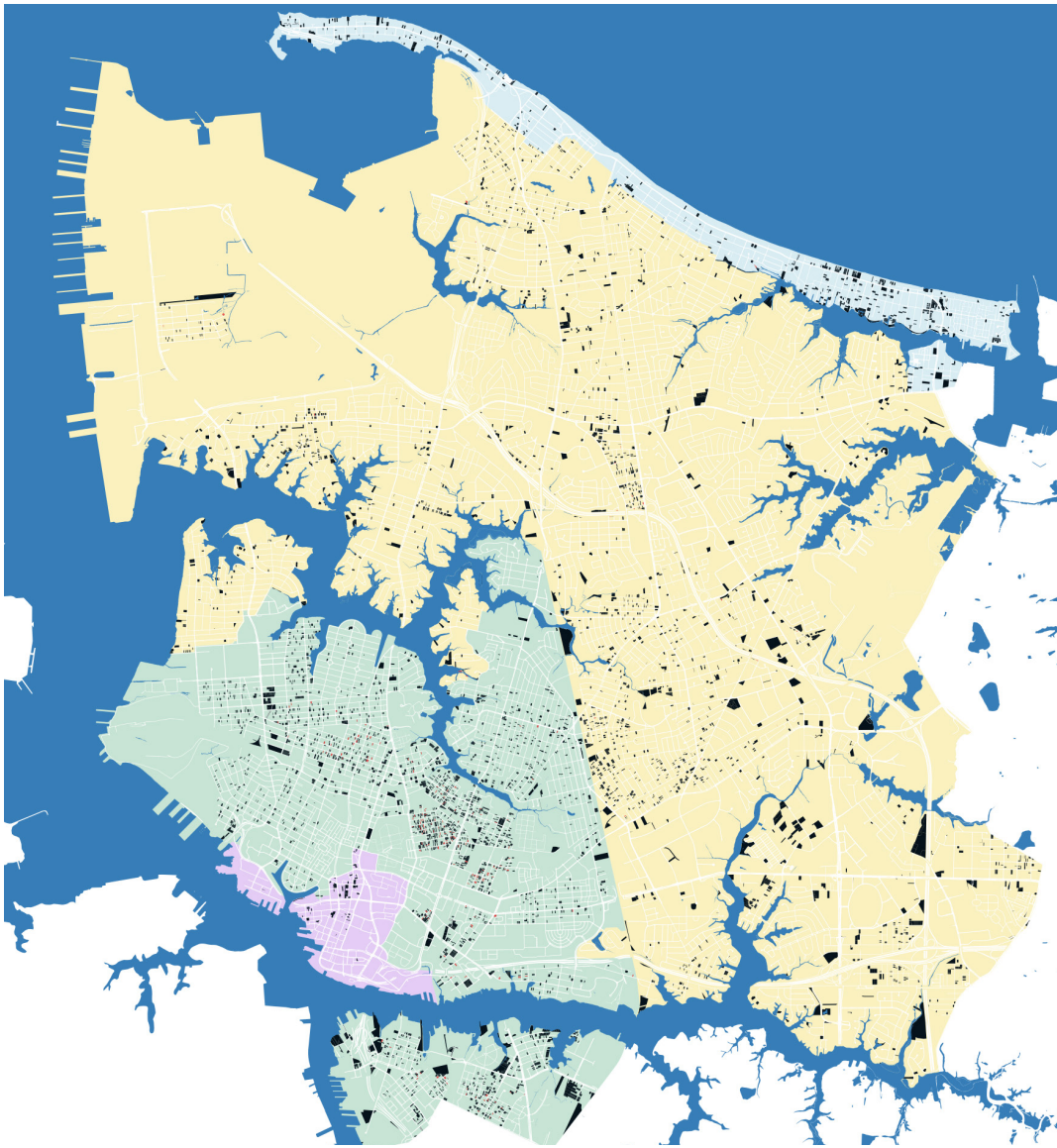
Zoning &
Character Districts

- **Traditional and Coastal** character districts have higher concentrations of zoning districts which currently permit Missing Middle-type housing.

- **Suburban** character district does have a good number of areas zoned to allow this type of housing, but they are small in area, very spread out, and not typically in particularly walkable areas.

- **Single Family-Traditional** zoning districts encompass neighborhoods in which Missing Middle housing is a typical component of the neighborhood development pattern. We believe this zoning district should be amended to permit Missing Middle housing.

The map shows areas zoned Single Family-4, 6, 8, and 10. We would suggest that these areas be studied as to whether or not they would be suitable for the addition of Missing Middle housing.
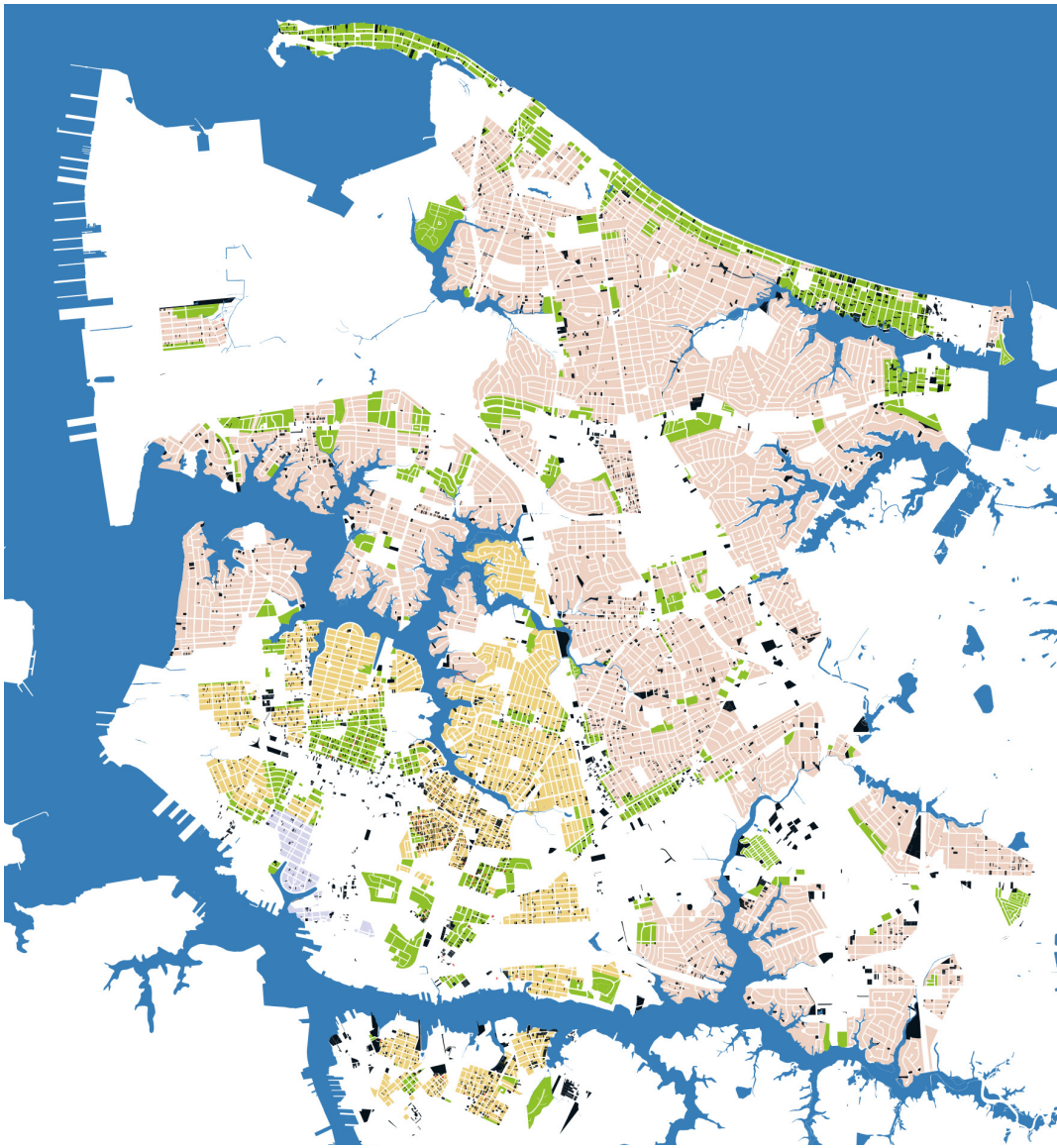
Legend:

- **Zoning permits Missing Middle**
- *Single Family Traditional (SF-T) District*
- *Other Single Family Districts*

- Vacant land is a broad category that includes all land with no structured improvements, that are not zoned as open space.

- Some vacant lots are used as extended side yards, parking, and other dedicated uses.

- Other lots are truly vacant and have no regular users and are awaiting future development.

Vacant Land
Downtown Character District
Traditional Character District
Suburban Character District
*Coastal Character District*

The Missing Middle
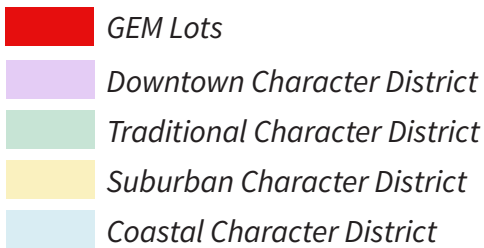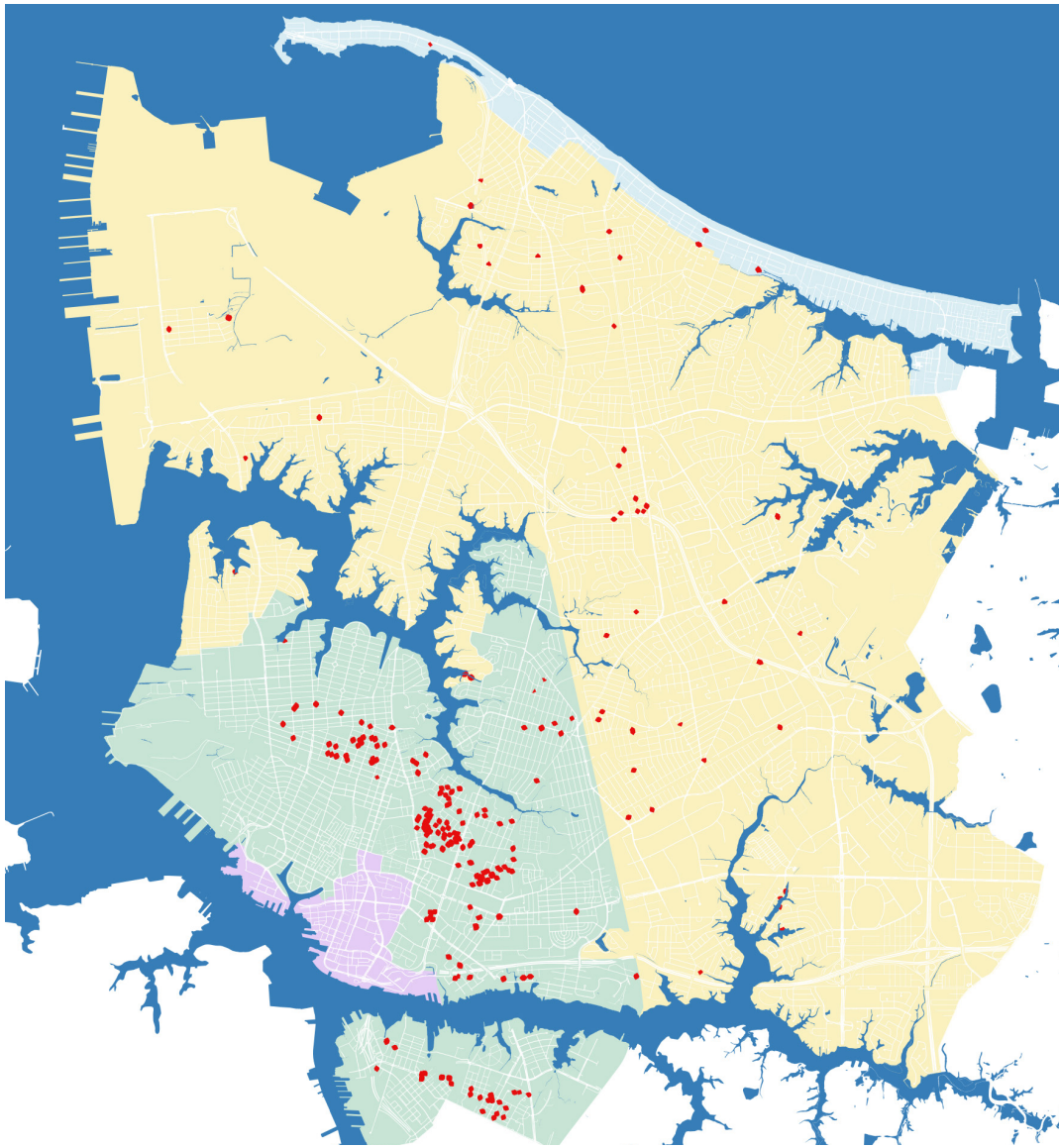
- GEM lots are City-owned lots which were acquired in order to offset delinquent property taxes.

- They can be sold to private developers for an amount that covers the delinquent taxes.

- Some lots are considered to be too small to be developed singly, while others are deemed large enough to be developed alone.

- This should be examined to determine whether the lots that are considered too small are consistent with the prevailing development pattern and should be reverted to the Single Lot Development list.

■ GEM Lots
■ Downtown Character District
■ Traditional Character District
■ Suburban Character District
■ Coastal Character District

- High concentrations of vacant lots and GEM lots are in the Single Family-Traditional zones, with some, but not as many, in the Multifamily-Neighborhood Serving zone.

- A casual survey of a random sampling of vacant lots showed many in the Traditional Character District to be unused lots ready for redevelopment.

- Many of those in the Suburban character district are in active use by adjacent property owners, who are frequently the owner of the vacant parcel.

Zoning permits Missing Middle

SF-T District

Other Single Family Districts

Vacant Land
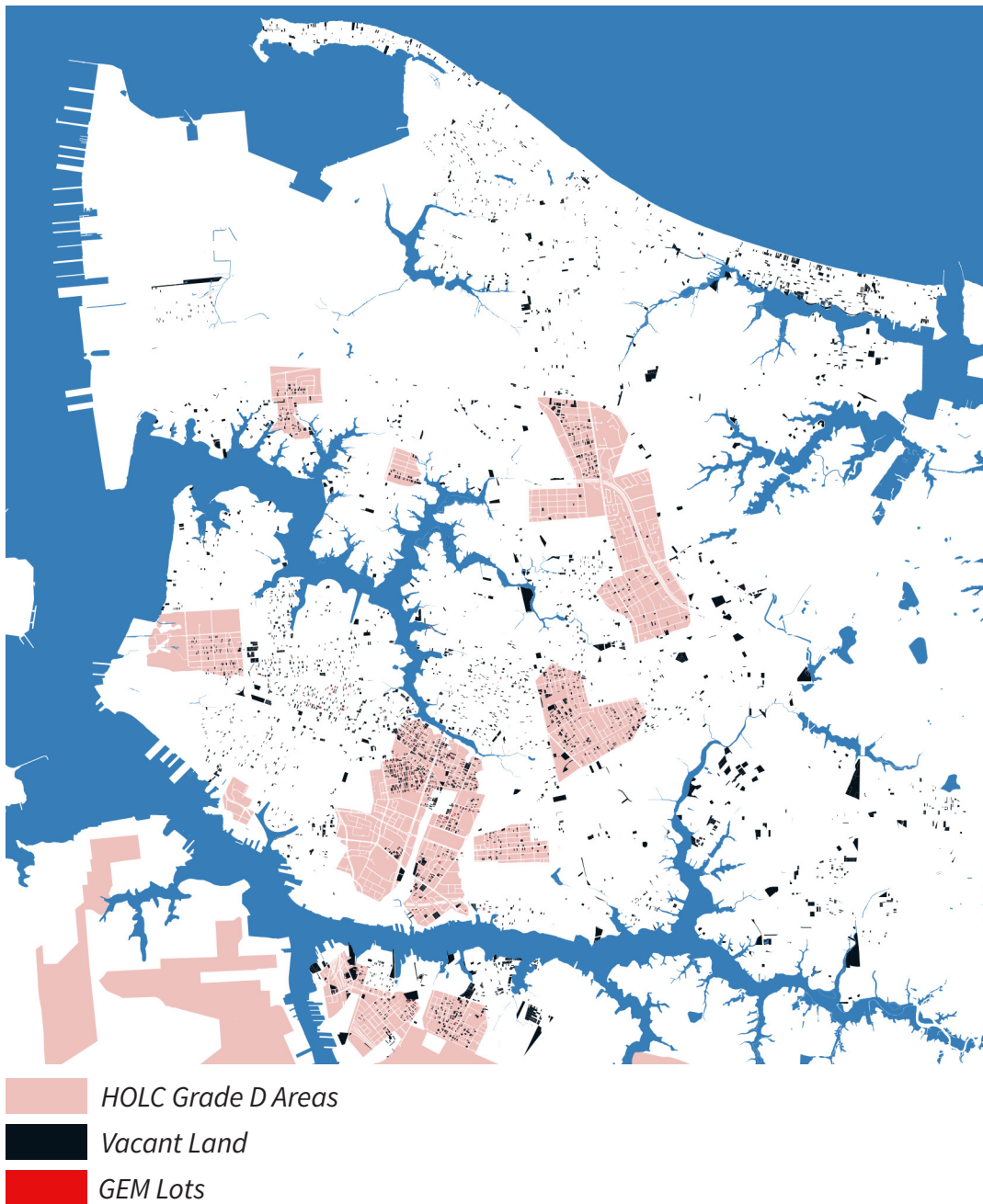
- This map illustrates areas in the City which were "redlined" on the 1940 HOLC map.

- These areas were denied mortgages and historically have led to higher rates of vacancy and absentee ownership.

Legend:

- HOLC Grade D Areas
- Vacant Land
- GEM Lots

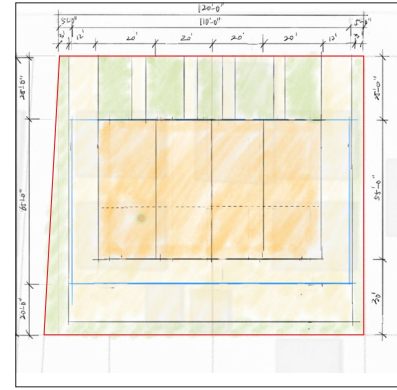City of Norfolk

Site Plans & Parking

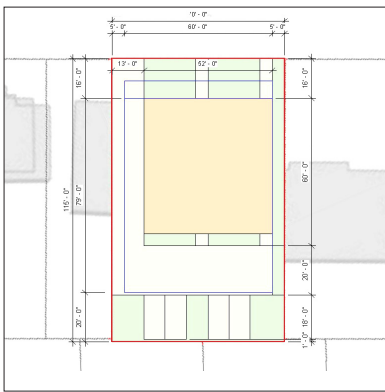# Unit Type Family — Adapts to Zoning Requirements
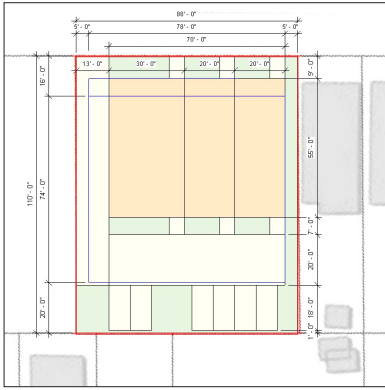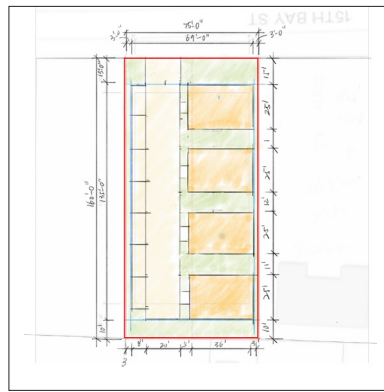

Traditional Site #1
219 W 27th Street
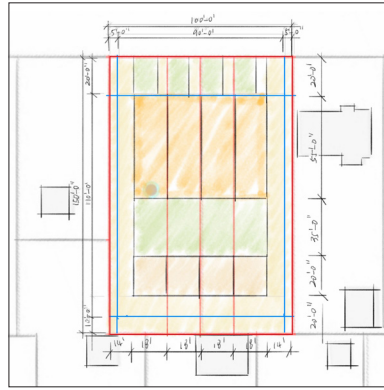
Coastal Site #1
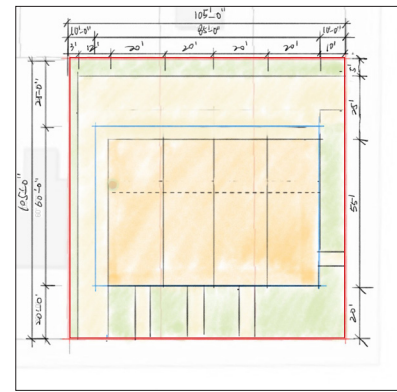1923 E Ocean View Avenue

Suburban Site #1
1533 Nevada Avenue

Traditional Site #2
1232 Hanson Avenue

Coastal Site #2
9617 15th Bay Street

Suburban Site #2
1008 Baltimore Street

Norfolk Zoning Types	MMH Types
Multi-Family	• X-Plex (side-by-side) • X-Plex (stacked) • Other types
SF semi-detached	• Duplex (side-by-side)
Two-family	• Duplex (side-by-side) • Duplex (stacked)
Townhouse	• X-Plex (side-by-side)
Live-work	• All types

Lot depth determines unit type

Lot width determines unit number

City of Norfolk

85

City of Norfolk Character Districts

Traditional

GHENT, COLONIAL PLACE, PARK PLACE, RIVERVIEW, OLDE HUNTERSVILLE, CAMPOSTELLA, ETC.

- Mixture of single-family and multifamily
- Commercial uses mixed into neighborhoods
- Some historic districts
- Many in flood zones

- Primarily platted on 25' to 35' lots

Suburban

WARDS CORNER, LARCHMONT, NORVIEW, MILITARY CIRCLE AREA, ETC.

- Primarily single-family
- Commercial zoned into separate areas
- Few historic districts; more possible in the future

- Primarily platted on 50' to 100' lots, but older areas on 35' lots

Coastal

OCEAN VIEW

- Mixture of single-family and multifamily
- Commercial mostly zoned into separate areas, but some are mixed
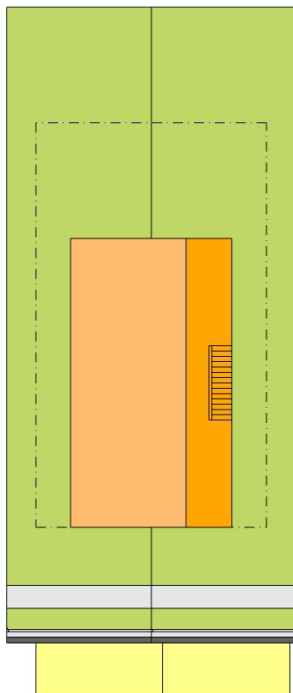
- Mixture of lot sizes

Downtown

DOWNTOWN, NEON, FREEMASON, ST. PAUL'S

- Mixture of single-family and multifamily
- Commercial uses mixed with residential uses
- Multiple historic districts
- Most in flood zones

- Primarily platted on 25' to 35' lots
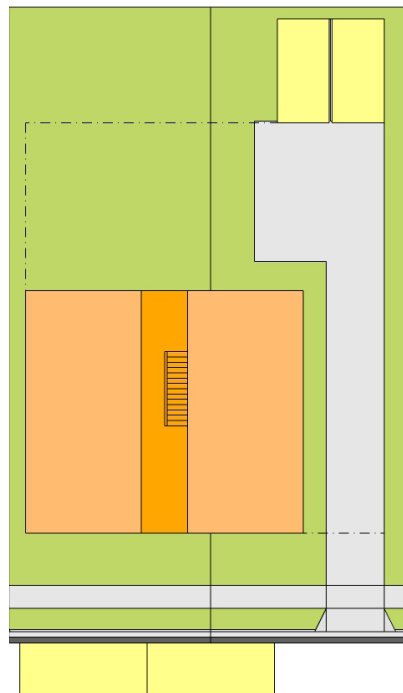- Many larger lots due to subdivisions

Suggested Missing Middle Parking Diagrams

Three-Unit Parking Diagram

Three-unit buildings can make use of an existing curb cut or new driveway if desired, but on-street parking is sufficient.
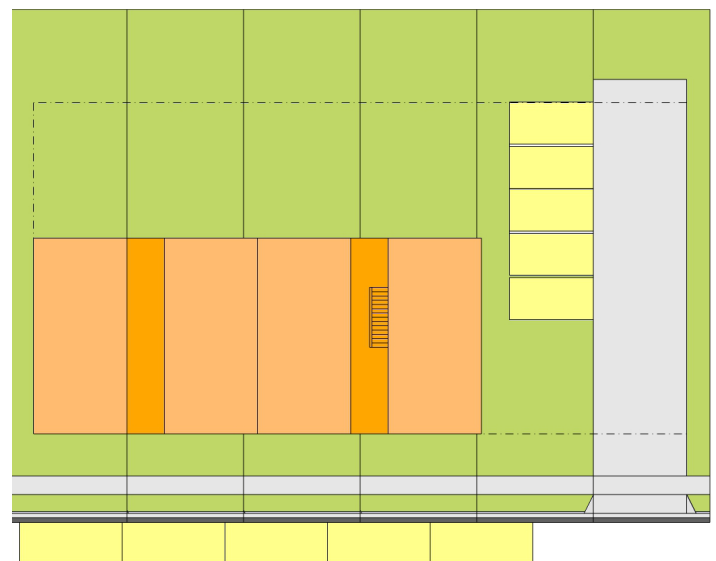
Six-Unit Parking Diagram

Six-unit buildings must accommodate at least 2 off-street parking spaces. These can typically be located behind the building, accessed by a driveway with a turnaround so that tenants do not have to back all the way out to the street. If space allows, these off-street spaces could be located along the side of the building. The rest of the parking is located on-street.
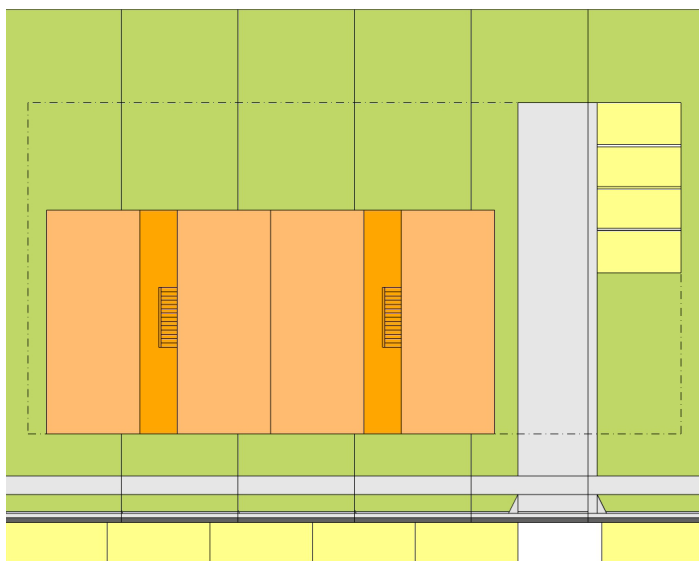
Eight-Unit Parking Diagram

Eight-unit buildings must accommodate at least 4 off-street parking spaces. These spaces are located behind the building, accessed by a driveway. The remaining parking needs are met with on-street spaces.

Twelve-Unit Parking Diagram

Twelve-unit buildings must accommodate at least 5 off-street parking spaces behind the building. The remaining parking needs are met with on-street spaces.

Detached Single-Family Houses · Duplex: Side-By-Side + Stacked · Fourplex: Stacked · Courtyard Building · Cottage Court · Townhouse · Multiplex: Medium · Triplex: Stacked · Live-Work · Mid-Rise

Missing Middle Housing

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OPTICOS

REMEMBER...MISSING MIDDLE IS ABOUT:

- The **form, scale, and type of housing that fit in with single-family** walkable neighborhoods

- **House-scale buildings** that happen to have multiple tenants in them (both renters and homeowners)

- **Housing choice** — broad range of housing types such as duplexes, triplexes, "Norfolk six-packs", town homes, courtyard apartments, cottage courts and more

- **Attainability** — high quality homes that are affordable for our workforce and retirees

IMPLEMENTING MISSING MIDDLE IN YOUR NEIGHBORHOOD:

- Lead walking tours

- Create a photo library

- Map out where Missing Middle exists

- Protect the Missing Middle that we have

- Include neighbors, builders and developers

- Make Zoning changes to allow for it

- Start a pilot project on City-owned property

The Missing Middle