

Missing Middle Housing for Chattanooga



CNE believes the future
of Chattanooga is rooted in
the vibrancy of all our
neighborhoods and the
prosperity of all our people.

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Executive Summary

Established in 1986, Chattanooga Neighborhood Enterprise (CNE) is a comprehensive nonprofit organization dedicated to the revitalization of distressed urban neighborhoods in Chattanooga through multifaceted initiatives. One of its primary goals is to promote economic diversity in these neighborhoods by offering housing options that cater to a wide range of income levels, serving both homeowners and renters. CNE achieves this by implementing various neighborhood revitalization programs and initiatives.

Over its 37-year history, CNE has played a significant role in shaping the housing market in Chattanooga. This involvement has encompassed renovation and new construction projects, including properties in both the market-rate and income-restricted categories.

Starting in the early 1990s, CNE's real estate development efforts focused on creating a diverse portfolio of building types that seamlessly integrated into the traditional

neighborhood scale. These building types spanned the spectrum from single-family detached dwellings to small-footprint apartment buildings, with small-scale apartment buildings (ranging from two to sixteen units) being a particular focus. During the 1990s and early 2000s, CNE successfully developed over a thousand for-sale and rental units using this typology. This typology is now enjoying a revival as "Missing Middle" housing across the rest of the county.

CNE's revitalization efforts often involve small-scale urban infill lots, which are prevalent in Chattanooga's urban core. Missing Middle buildings are the perfect solution for these lots, as they allow neighborhoods to add density to multi-family buildings without significantly altering the neighborhood's character. However, the challenges arise from local zoning restrictions, which often categorize smaller multi-family units in the same way as large commercial multi-family buildings, leading to additional costs due to commercial building codes.

In 2014, with funding from the Benwood Foundation and Lyndhurst Foundation, CNE acquired thirty-two vacant lots concentrated in the Highland Park and Ridgedale neighborhoods. Both are known for their traditional urban patterns, walkability, housing diversity, and proximity to downtown. These lots offered a variety of opportunities to develop Missing Middle building types. CNE initially sold six single-family lots to a private homebuilder, creating early redevelopment momentum in Highland Park. Simultaneously, CNE embarked on its most substantial project to date, a 50-unit, three-story apartment building called "The Mai Bell" along Bailey Avenue.

With additional funding from the Lyndhurst Foundation, CNE collaborated with the Incremental Development Alliance (IDA) to expand its Missing Middle development. The IDA team worked on creating a range of prototype



buildings, including duplexes, multiplexes (4-12 units), live/work buildings, and cottage courts, tailored to the constraints of the Ridgedale and Highland Park neighborhoods.

Following a charrette in 2016, CNE's design team worked to refine site plans for the Ridgedale lots. They had to find creative interpretations of existing zoning codes to accommodate Missing Middle buildings, as these codes were not originally designed for this type of development. Additionally, challenges related to stormwater regulations, sprinkler requirements, and utility connections for smaller multi-family buildings needed to be addressed.

Financing remained a critical challenge in maintaining affordability for new construction projects. CNE's financing structure included a combination of equity and conventional bank debt, avoiding the use of federal tax credits (LIHTC) to keep the per unit cost down, speed up the conception to completion timeframe, and allow for smaller-scale buildings on scattered sites that fit into the existing fabric of the neighborhood. HOME funds from the City of Chattanooga were used to make 20% of rental units affordable to households at 50% - 60% of

the Area Median Income (AMI). The remaining units were targeted to be affordable at 80% AMI. This was possible through equity of previously purchased land, CNE's own resources, and grants from the Lyndhurst and Benwood foundations. CNE also secured favorable bank financing terms due to a special tax incentive offered by the state of Tennessee's Community Investment Tax Credit program.

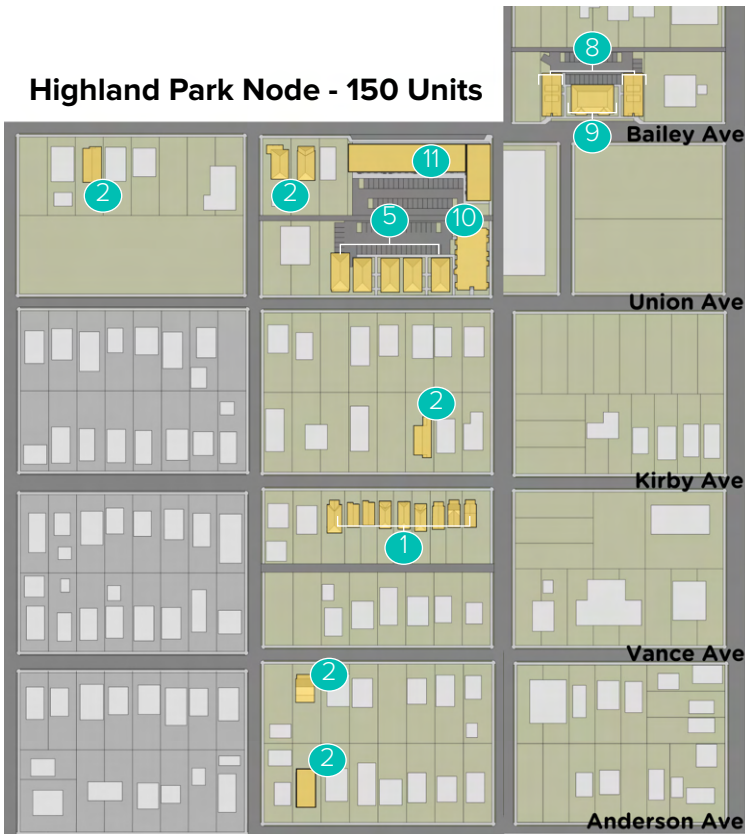
CNE and its local foundation partners remain committed to creating healthy, walkable neighborhoods that offer a variety of housing options for residents across income levels. They recognize the vital role of urban design and architecture in enhancing neighborhood quality and walkability, with a focus on improving living conditions for all residents. The team has invested significant time and effort in designing Missing Middle prototypes that harmonize with the neighborhood context, setting an example that private developers have since emulated. From 2017 to the projected completions in 2025, CNE will have built ten different prototypes, with 241 housing units, on scattered sites in Highland Park and Ridgedale.



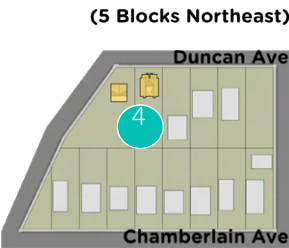
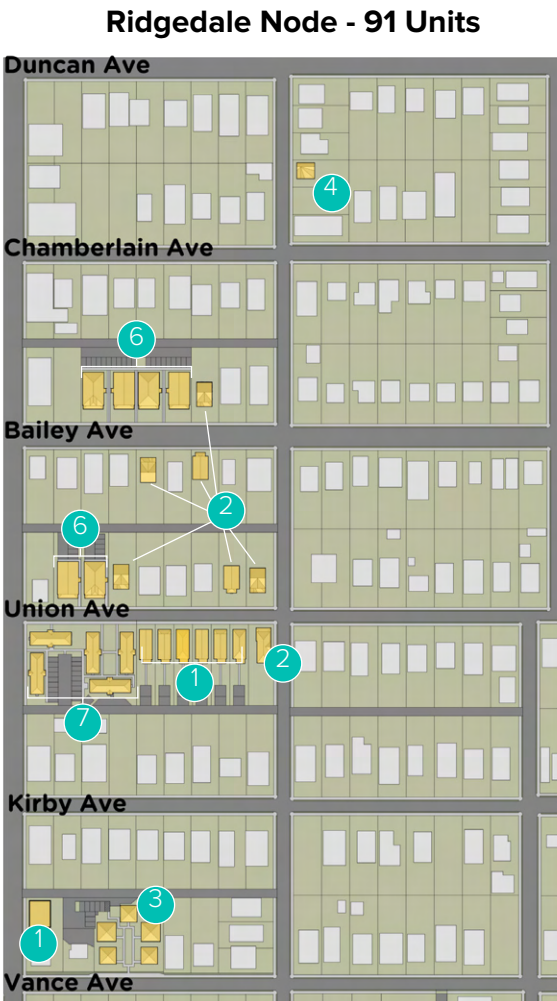
Types and Maps

Ridgedale Node	# of Buildings	# of Units
Duplex	3	6
Sixplex	6	36
Courtyard Sixplex	5	30
Narrow Lot Cottage	7	7
Standard Lot Cottage	7	7
Cottage Court	5	5

Highland Park Node	# of Buildings	# of Units
Narrow Lot Cottage	9	9
Standard Lot Cottage	7	13
Quadplex	5	20
3-Story Walk-up (Mai Bell II)	1	27
10-plex	2	20
12-plex	1	12
3-Story Small Format (Mai Bell)	1	49
Totals	59	241



	Building Types
1	Narrow Lot Cottage
2	Standard Lot Cottage
3	Cottage Court
4	Duplex
5	Quadplex
6	Sixplex
7	Courtyard Sixplex
8	10-plex
9	12-plex
10	3-Story Walkup (Mai Bell II)
11	3-Story Small Format (Mai Bell)

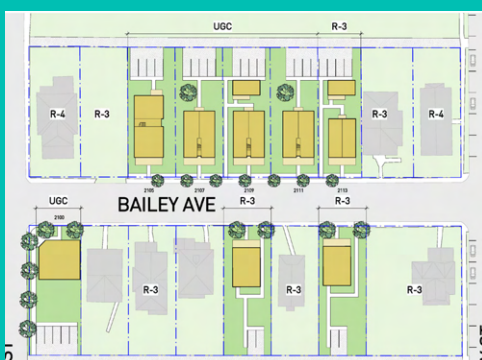


PRE-CONSTRUCTION 2013 - 2016

Early years of the project were spent acquiring land, meeting with stakeholders, and working on reproducible prototypes for the area.



CNE partnered with local and national nonprofits to assemble best practices for middle scale housing construction, to provide education to practitioners and stakeholders, and to create neighborhood-scale specific implementation strategies. All projects recieved detailed regulatory review to ensure the proposed initial planning was feasible.



The lack of right sized zoning regulations was the first major hurdle, followed by fitting modern water and sewer utilities, stormwater and related infrastructure requirements on small lots.

2014 - 2015

Initial properties acquired from Tennessee Baptist University.

July 2014

Met with stakeholders and community residents to collaborate on development possibilities.

2015

Environmental remediation of sites and initial land planning for small cottages.

July 2016

Construction completed on nine Kirby Avenue Cottage homes.

August 2016

Missing Middle Housing Prototype Project team assembled by CNE and Lyndhurst Foundation, led by the Incremental Development Alliance, to produce initial drawings and proformas for Chattanooga specific infill housing types.

October 2016

Real Estate Training Workshop provides technical assistance to local building professionals and trades on implementing Missing Middle Housing and provide opportunity for community stakeholder input to draft prototype documents.

2016

Purchased 9 contiguous vacant lots in Ridgedale from Highland Park Commons on Union Avenue.

December 2016

Rezoning process begun to find pathways for both multi-family and narrow cottages within existing district regulations.

CONSTRUCTION ERA 1

2017 - 2019

Early construction was primarily detached cottages on scattered, standard 50' wide lots or on a contiguous property replatted to 30' wide lots. The replatted lots accommodated more houses on the block.



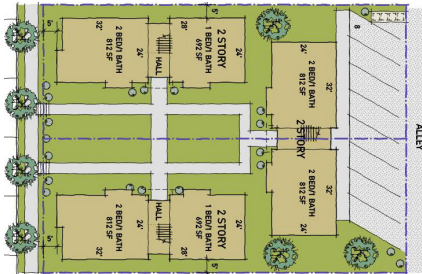
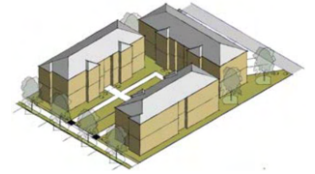
The completion of the sixplex at 2105 Union Avenue, the first multi-unit building in the project, was a major milestone.



Collaboration with builders and subcontractors increased their capacity to successfully construct multi-plex buildings. These multi-plexes are more complex to build under the commercial building code. This partnership was key to successfully scaling up the project and completing five more sixplexes by the end of 2019.

January 2017

15 Prototypes were designed for the Missing Middle Catalog, including plans for 1-18 units on single and double lots.



12 UNITS - 9,264 SF TOTAL	
4x 1-Bed, 1 Bath	692 sf
8x 2-Bed, 1 Bath	812 sf
PARKING - 12 SPACES	
On-street	4
Off-street	8
SITE	
Corner lot	No
Mid-block	Yes
Multi-lot required	Yes

August 2017

Mai Bell project completed (49 residential units, 2 commercial).



2018

The first sixplex, 2105 Union, is completed and leveraged to complete the construction financing for Union Avenue Courtyard Apartments.

2019

6 small single-family homes are completed on Union Avenues on single infill lots.

December 2019

The Union Avenue Courtyard, five sixplexes arranged in two courtyards, is substantially completed.

CONSTRUCTION ERA 2

2020-2025

Pandemic-related construction delays aside, production kicked into high gear post-2020. The first iterations of duplexes, quadplexes and cottage courts were built in this era.



Due to rising costs, buildings were grouped to reduce financing and utility expenses. Additionally, projects were phased in close succession to remain manageable for building contractors. Striking this balance proved critical in completing projects at a steady pace and working towards the remaining prototypes, such as the 10-plex, 12-plex and larger walkup housing structures. Challenges such as larger utilities, the addition of sprinkler systems, and the navigation of common outdoor spaces, and stormwater layouts continue to need creative solutions.

2020-2021

Row of 4 sixplexes completed on Bailey Ave.

2021

Sixplex completed at 2103 Union Ave.

Summer 2022

First duplex and quadplex completed on Duncan Ave and Union Ave.

Fall 2022

A row of five Union Avenue quadplexes are completed in Highland Park as part of Mai Bell Phase 2.

2023

Highland Park node completed (150 units in 26 buildings over 6 years).

2023

5 unit cottage court completed at 2107 Vance Avenue.

2024

Estimated completion of two 10 plexes and one 12 plex on replated site on Bailey Avenue for a total of 32 additional units.

2024

Ridgedale node projected to be completed (91 units in 33 buildings over 7 years).

2024-2025

Future Mill Town Node (south of Ridgedale), to include a duplex, quadplex, two sixplexes, a 10-plex, and a 20-unit 2-story walkup, for a total of 50 units.



Missing Middle Housing Case Studies







Aerial view of Union Avenue Projects in the Ridgedale neighborhood

Missing Middle Housing Prototypes

Through a collaboration between Chattanooga Neighborhood Enterprise, the Lyndhurst Foundation, the Benwood Foundation, state and local financing partners, 249 units of housing have been and will be constructed through 2025 on common sized infill lots in the Ridgedale and Highland Park neighborhoods of Chattanooga. This collection of built projects was comprised of eight different housing prototype configurations from single cottage to 12-unit buildings, and standalone plexes to multi-building courtyards.

This document catalogs these types in a two-part approach: the first page (with teal blue accent colors) discusses the building type itself and the second (in red) describing where and how the type was specifically implemented in the overall project to date. The building type page has floor plans, square feet, lot size, features and credits to the design teams. The project pages show site plans, photos of the completed construction and details about how the prototype was utilized to solve a particular financing, urban design or housing diversity goal.

A chart detailing monetary sources and uses is provided to illustrate the evolving financing structures utilized to complete these mostly for-rent projects. Due to rapid inflation during the later years of construction, percentages were used to provide consistency instead of per unit costs. Through this comprehensive documentation of built work, it is hoped that other cities can understand how the prototypes were calibrated for the specific needs of Chattanooga's neighborhoods and what financial tools were used to bring these ideas to fruition.

Cottage Prototype

Cottage fits on 30' lots, making a more walkable block with front doors and porches closer together. Smaller homes deliver a lower initial price, making them accessible to many first-time homebuyers, while allowing for future expansion.

This narrow-deep proportioned cottage is designed specifically for lots 40' and under. The front porch spans the entire width of the house, providing an extra living space that is a natural extension of the forward facing kitchen and living room. Two bedrooms are tucked into the rear, one with a walk-in closet and sliding patio door to access the rear private patio. The laundry area doubles as a side entry space. Each room in the house has a window, even the master closet, distributing daylight throughout and promoting excellent cross ventilation. A two-car parking pad is located at the rear of the site accessible from the alley.

Prototype Specs:

Architects:

Elemi Architects

Current Locations:

2112-2132 Union Ave

SF: 900 SF

(2-bedrooms, 1.5-bathrooms)

Footprint: 20' wide, 52' deep

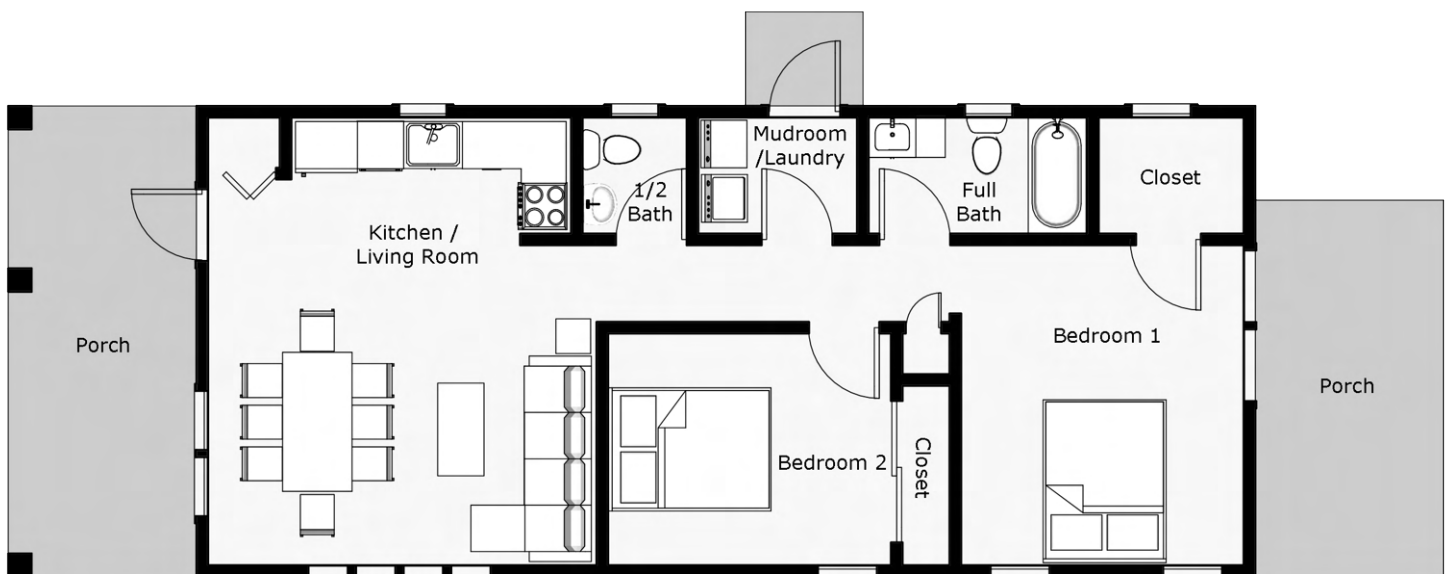
(includes porches)

Typical Lot SF: 4020 SF

Lot Dimensions: 30' x 134'

Number of Buildings on Lot: 1

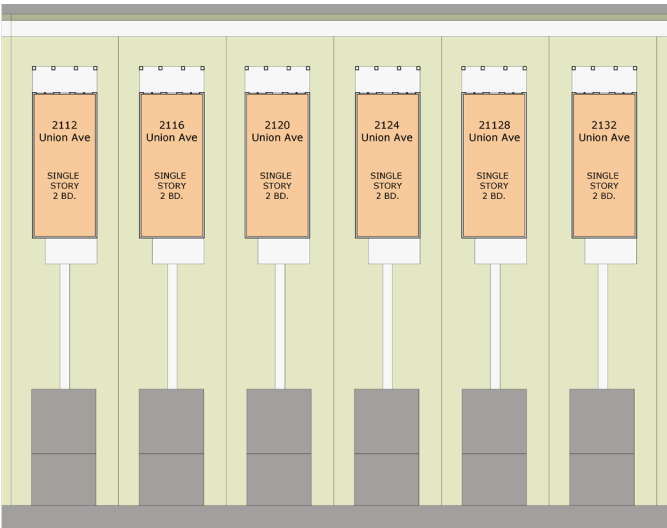
Parking: 2 spaces on rear parking pad



Narrow cottage ground floor plan

Union Ave Cottage Row

This row of six cottages utilized the same floor plan while varying rooflines, colors and porch details to provide visual variety. The 30' lots were divided from larger original plats to help provide a diversity of size and price in the neighborhood and to create more homeownership opportunity. The desired lot sizes and setbacks were achieved through the creative use of a townhome centric zoning district. The single-story cottages transition the block from multi-unit structures to larger lot single-unit houses. The cottages were completed in 2019 and built by Mtn City Construction.



Union Ave Cottage Row Site Plan



Finished row of cottages on Union Ave

Project Costs (2112 Union Ave)		Equity and Debt	
Land Costs	1 %	Construction Loan	75 %
Hard Costs	74 %	Foundation Land Purchase/Land Value	1 %
Soft Costs	25 %	CNE Cash/Other Equity	24 %

Duplex Prototype

Side by side duplex format is a compact two-story structure that can work well as housing for sale or for rent. A variety of rooflines and front entries can create symmetrical and asymmetrical elevations that fit into any block.

The twin units in this duplex feature an open concept ground floor plan with the kitchen and living room opening up to the staircase to the second floor. A center peninsula provides dine-in seating and additional kitchen prep space. The rear of the unit features a powder room, laundry and mudroom that opens up to a door to the backyard. The upper floor has two bedrooms and a shared bathroom. Outdoor space is easy to access and adapt to expand the usable living space of each unit.

Prototype Specs:

Architects:

Lawrence Mathis Design

Current Locations:

408 S. Kelly, 2510 Duncan Ave, 2512
Duncan Ave

SF Per Unit: 916, 1832 SF total

(2-bedrooms, 1.5-bathrooms)

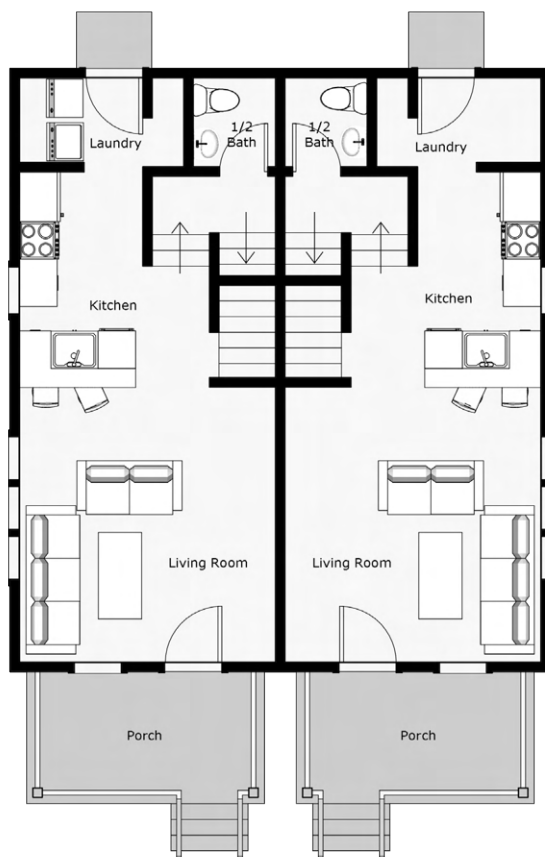
Footprint: 29' wide, 38' deep
(includes porches)

Typical Lot SF: 5360 SF

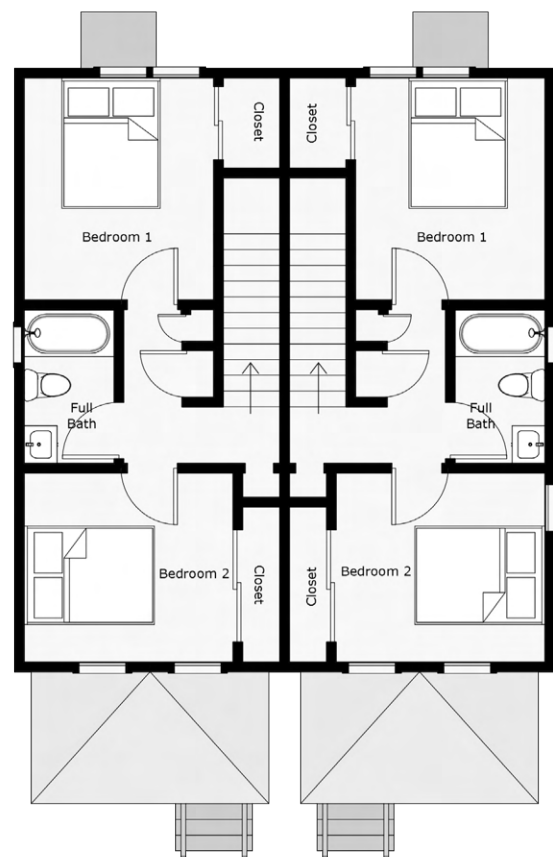
Lot Dimensions: 40' x 134'

Number of Buildings on Lot: 1

Parking: 2 spaces on rear parking pad



Duplex first floor plan



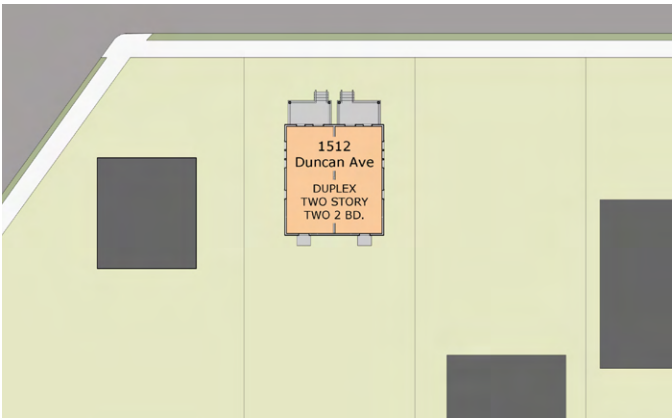
Duplex second floor plan

2512 Duncan Duplex

The duplex was one of three models built concurrently, each utilizing a lot which was wider and shallower than a standard lot. 2512 was part of a corner lot that was subdivided to maximize housing opportunity. This allowed for additional space for rear parking in the triangle shaped lot. The project focused on providing workforce housing at slightly below market rents. The duplex was constructed by Scenic City Development, financed by SmartBank and was completed in 2022.



Finished Duplex on Duncan Ave



Duncan Duplex Site Plan

Project Costs (2510 Duncan)		Equity and Debt	
Land Costs	13 %	Construction Loan	79 %
Hard Costs	78 %	Land Value	13 %
Soft Costs	8 %	CNE Cash/Other Equity	8 %

Quadplex Prototype One-Bedroom

This one-bedroom quadplex is the perfect infill building, featuring a front porch and single front door on the street facing facade and two sizes of one-bedroom units.

The one-bedroom quadplex is a two-story walk-up building with two slightly different stacked unit plans facing front and back. The front porch extends the entire width with a door to the ground floor front unit.

Access to the second-floor units and rear ground floor unit is accessed off a small back porch entry. Although varying in square footage, each unit has an open kitchen-living room layout with peninsula high top seating area.

Prototype Specs:

Architects:

Kronberg Urbanists and Architects

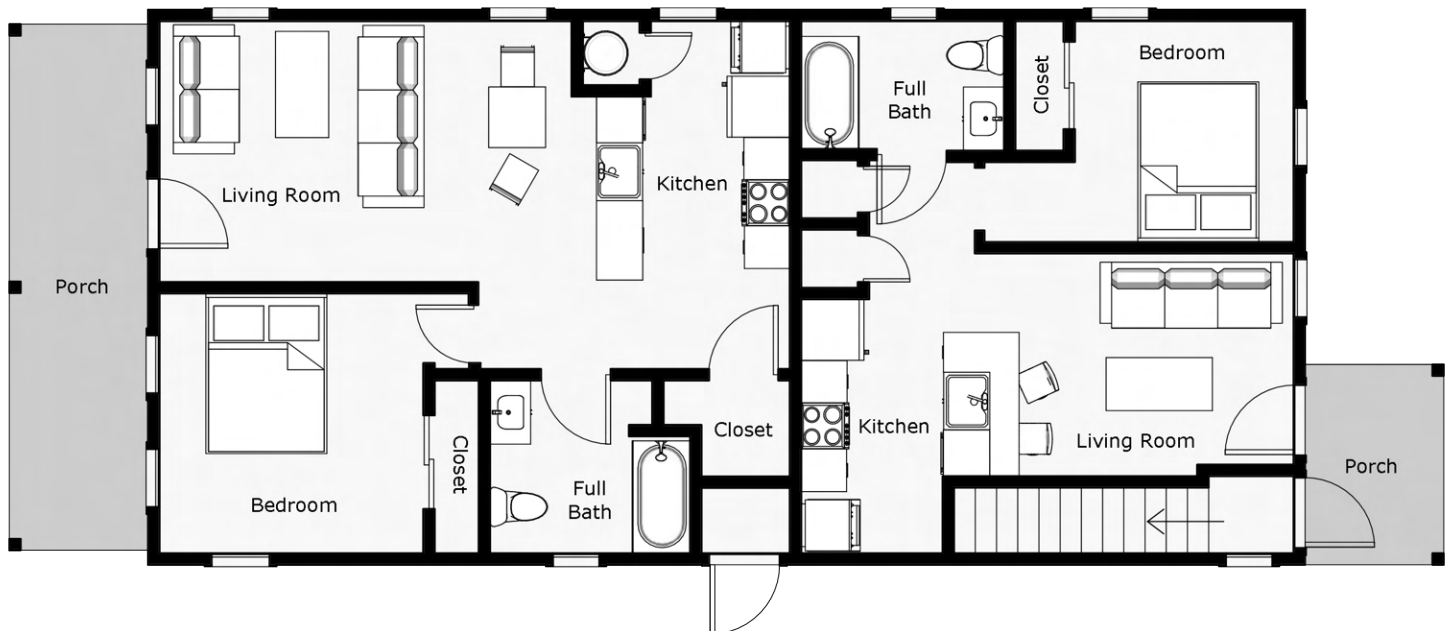
Current Locations: 1715 Union Avenue

SF Per Unit: 792 or 800, 3184 SF total
(1-bedroom, 1-bathroom)

Footprint: 24' wide, 62' deep
(includes porches)

Typical Lot SF: 5360 SF
Lot Dimensions: 50' x 134'

Number of Buildings on Lot: 1
Parking: 4-8 spaces, onsite and on-street



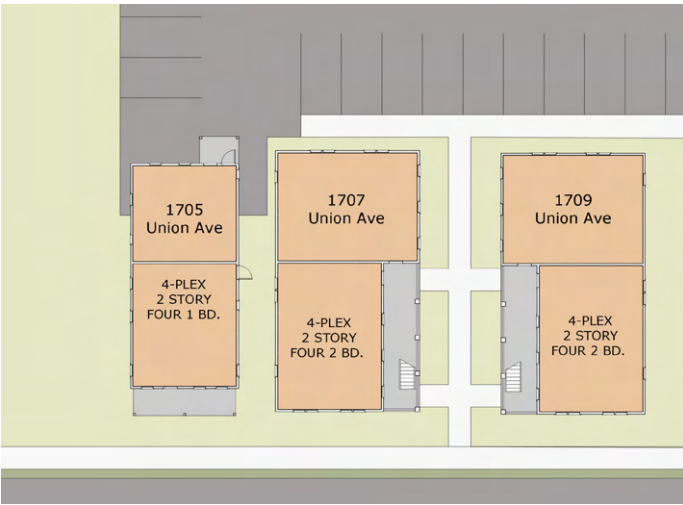
Quadplex first floor plan

1717 Union Ave

The one-bedroom quadplex was utilized as a part of the larger Mai Bell 2 development, a 47-unit cluster of walk-up buildings at Union Avenue and Hawthorne Street in Highland Park built by RLP Construction. It was at the interior end of the development row, which included a row of two-bedroom quadplexes and a larger three-story walk up building on the corner. Being the smallest structure, it was used to mimic the scale of a single or duplex building with a single front door and one-story porch, to transition to similar size buildings on the rest of the block. Off-street parking was available to the rear and connected to a larger parking access area. The project was completed in the fall of 2022 and financed by BrightBridge Capital and Citizens Tri-County Bank.



Finished Quadplexes on Union Ave



Union Ave Quadplex Site Plan

Project Costs (1715 Union)		Equity and Debt	
Land Costs	7 %	Construction Loan	75 %
Hard Costs	79 %	Land Value	4 %
Soft Costs	14 %	CNE Cash/Other Equity	1 %
		Home Funds	6 %
		Foundation Grants	14 %

Quadplex Prototype

Two-Bedroom

This two-story, stacked unit format is comprised around a front corner staircase, which lends the ability to be easily paired with a mirrored unit to create a mini-courtyard site plan.

This two-story, walk-up building features four units via two slightly different layouts that are stacked on top of each other. Both units enter into an open living room and kitchen, which access the bedrooms and bathroom through a side hall.

The building can be set on its narrow edge toward the street to create shared site space between or with the staircase width toward the street for wider lots that need additional parking space in the rear. The straight staircase layout is adaptable to add a third floor and two additional units above.

Prototype Specs:

Architects:

Kronberg Urbanists and Architects

Current Locations: 1707-1713 Union Avenue

SF Per Unit: 792 or 800, 3184 SF total (2-bedrooms, 1-bathroom)

Footprint: 32' wide, 58' deep (includes porches)

Typical Lot SF: 5360 SF
Lot Dimensions: 50' x 134'

Number of Buildings on Lot: 1

Parking: 4-8 spaces, onsite and on-street



Quadplex ground floor plan

Mai Bell 2 Quadplex

A row of four, two-bedroom unit quadplexes was built as a part of a larger site plan that comprised the Mai Bell 2, a 47-unit cluster of walk up buildings at Union Ave and Hawthorne Street in Highland Park built by RLP Construction. The quadplexes were paired with center sidewalks leading from the public street to a large rear combined parking lot accessed off the alley. The quads completed construction in the fall of 2022 and were financed by BrightBridge Capital and Citizens Tri-County Bank.



Finished Quadplex on Union Ave



Union Ave Quadplex
Row Site Plan

Project Costs (1707-1713 Union)		Equity and Debt	
Land Costs	7 %	Construction Loan	75 %
Hard Costs	79 %	Land Value	4 %
Soft Costs	14 %	CNE Cash/Other Equity	1 %
		Home Funds	6 %
		Foundation Grants	14 %

Sixplex Prototype

An asymmetrical, stacked layout with double story front porch and center building circulation accessed from a sidewalk starting at the front of the property.

This is an excellent floor plan for use on a corner lot or aligned in a row with centralized parking in rear. The arrangement would also lend itself well to a courtyard configuration.

The sixplex is two stories, with three units per floor, one 2-bedroom and two 1-bedrooms. The two-bedroom unit has a large porch facing the street, which leads into a large kitchen and living room. Each one-bedroom apartment opens on to the center hall/stairway and has windows to the side yard.

Prototype Specs:

Architects: Elemi Architects

Current Locations: 2103-2105 Union Ave, 2102-2108 Union Ave, 2105-2111 Bailey Ave, 712 S Willow St

Unit Type A: 792 SF
(2-bedroom, 1-bathroom)

Unit Type B: 504 SF
(1-bedroom, 1-bathroom)

Total SF: 4176 SF

Footprint: 36' wide, 64' deep
(includes porches)

Typical Lot SF: 5360 SF

Lot Dimensions: 50' x 134'

Number of Buildings on Lot: 1

Parking: 6-9 spaces, onsite and on-street



Sixplex ground floor plan

2107 Bailey Avenue

This sixplex was a part of a four-building row completed in 2021. These projects were combined into a single lot to maximize site utility efficiencies and parking, while minimizing stormwater infrastructure and commercial loan costs. The buildings were paired to share a central sidewalk from the front to the back of the site. A total of 18 parking spaces were provided onsite. RLP Construction was the general contractor for 2103-2015 Union Ave, and the project was financed by SmartBank.



Finished Sixplex on Bailey Ave



Bailey Ave Sixplex
Row Site Plan

Project Costs (2107 Bailey)		Equity and Debt	
Land Costs	7 %	Construction Loan	75 %
Hard Costs	80 %	Land Value	7 %
Soft Costs	13 %	CNE Cash/Other Equity	9 %
		Home Funds	8 %

Cottage Court Prototype

Small cottages with similar footprints and entries allow for mix & match combinations on unique lot shapes or double/triple standard size lots.

Two cottage formats allow for either one- or two-bedroom configurations to be utilized to fill out a lot that is at least 100' wide. The cottages each have a large combined living, dining and kitchen space, which is connected to separate porches in the front and back. This allows for easy access to parking and utilities in the rear of the site. The generous porch faces the courtyard to activate the semi-public center. The two-bedroom unit has a larger master closet and double sink in the bathroom.

Parking is typically available off-street from the rear alley or on-street along the front, the combination of which should yield 8-10 spaces.

Prototype Specs:

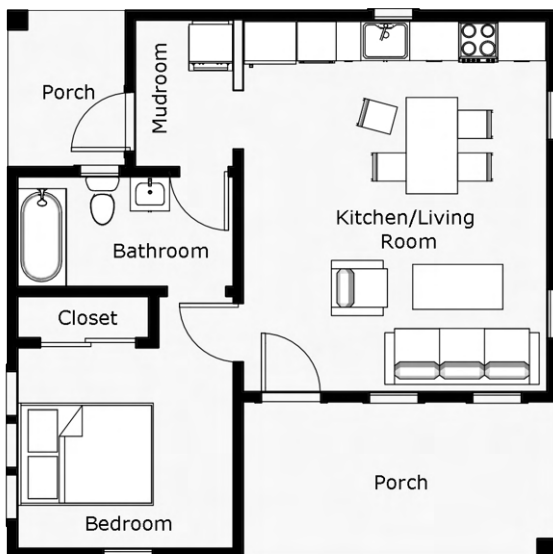
Architects: Elemi Architects

Cottage Type A: 608 GSF
(1-bedroom, 1-bathroom)
Footprint: 28' Wide, 28' Deep
(includes porches)

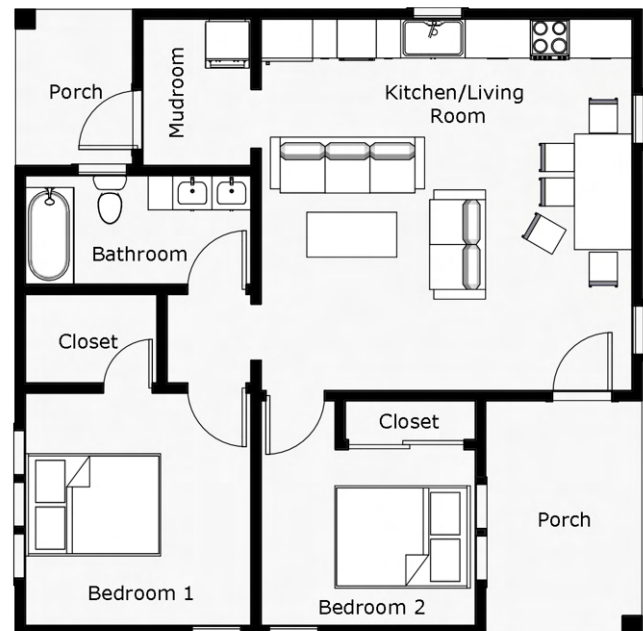
Cottage Type B: 880 GSF
(2-bedroom, 1-bathroom)
Footprint: 32' Wide, 32' Deep
(includes porches)

Current Locations:
2115-2125 Vance Avenue

Type A: 3 units
Type B: 2 units
Lot SF: 20,037, 0.46 AC
Parking: 8-10 spaces



Cottage Type A



Cottage Type B

Vance Avenue Cottage Court

The Vance Avenue Cottage Court places five cottages on two lots. The primary frontage is 125’ wide, and has additional space in the rear with a shared vehicle access easement with the adjoining property.

This allowed for significant center courtyard space (approximately 45’ x 80’) and an additional grassy area to the northeast corner of the site. Three Type A, one-bedroom cottages and two Type B, two-bedroom cottages created the U-shaped plan.

The two-bedroom units were located in the center of the site with their porches oriented towards the courtyard. The one-bedroom units have slightly wider porches and were better suited facing the street. The center rear cottage is slab on grade for enhanced accessibility, while the remaining cottages have raised porches with a crawlspace underneath.



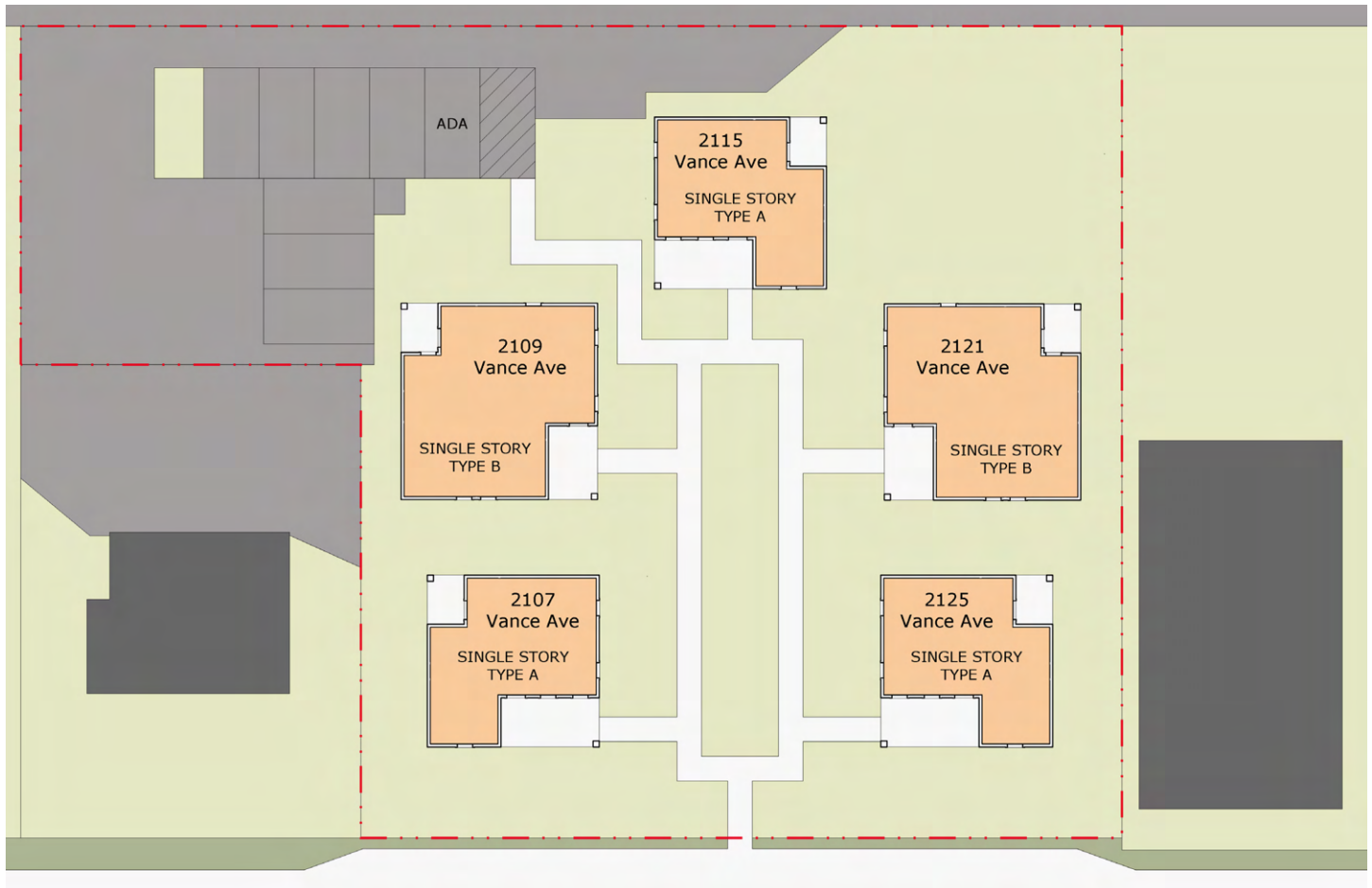
Cottage Type A



Cottage Type B

Project Costs (2115-2125 Vance)		Equity and Debt	
Land Costs	1 %	Construction Loan	73 %
Hard Costs	90 %	Foundation Grants	20 %
Soft Costs	9 %	CNE Cash/Other Equity	7 %

Vance Avenue Cottage Court



Vance Ave Cottage Court Site Plan



Finished Cottage Court on Vance Ave



Sixplex Courtyard Prototype

An asymmetrical building with a pair of one-bedroom units and a single two-bedroom unit flanking a center stair, the sixplex can be rotated to have both long and short sides facing the street or courtyard.

This long and skinny sixplex is a building block for maximum flexibility. The center staircase hosts a protruding balcony on the second floor that punctuates the entry location on the facade. The two-bedroom unit is split between the bedrooms and bath, and the open living space. The one-bedroom units are very compact, with living spaces as you enter the unit door followed by the bathroom and bedroom at the end of the hall. With each unit occupying a corner, there is exceptional capacity for cross-ventilation and great distribution of natural light throughout the interior of the units.

Prototype Specs:

Architects: Elemi Architects

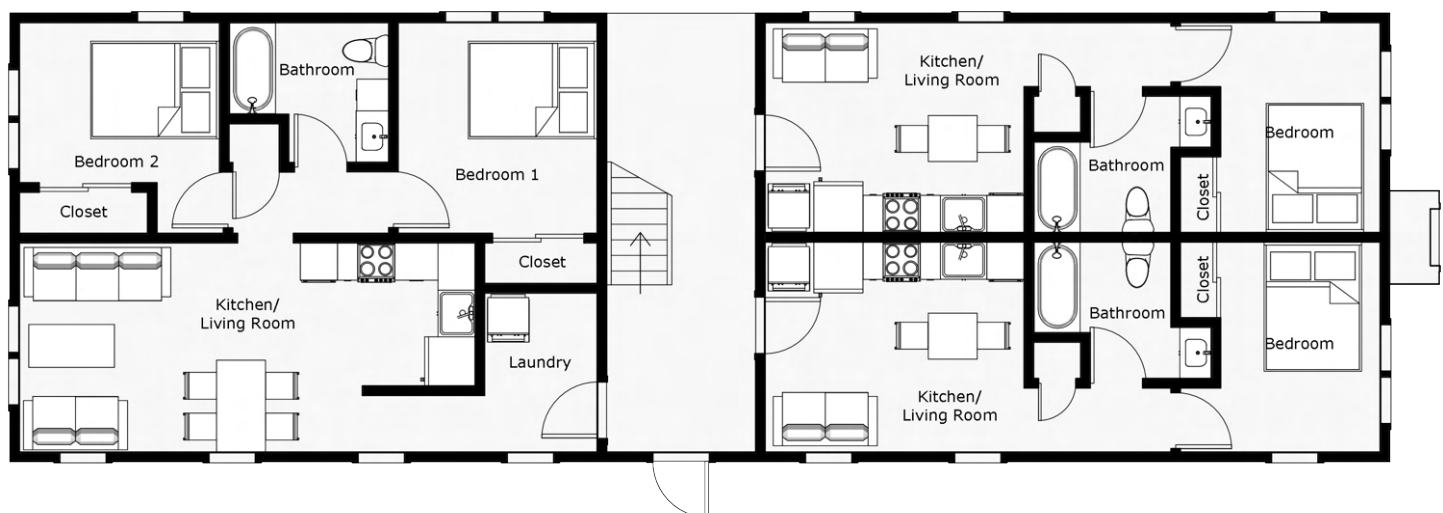
Current Locations: 2102-2108 Union Ave,
712 Willow St

Unit Type A - 408 SF
(1-bedroom, 1-bathroom)

Unit Type B - 768 SF
(2-bedroom, 1-bathroom)

Total SF: 3,360 SF

Footprint: 74' wide, 24' deep
(includes porches)



Sixplex ground floor plan

Sixplex Courtyard

The genesis behind the courtyard format was to provide a site plan that had a repeatable floor plan that could be oriented in different ways to also accommodate critical space for stormwater infrastructure, green space and a parking lot accessible off the alley. With the site occupying a corner, it was important to both have a strong presence of buildings directly on the corner, while also taking the opportunity to have a generous sized courtyard on the inner side of the block.

This combination approach generated 30 units and produced an alternative configuration to a double-loaded corridor bar building that is almost always the default building design for large apartment sites. There are 18 off-street parking spaces, but considerably more available on-street along the 300’ of street frontage.

The project was financed by SmartBank and constructed in 2020 by Mtn City Construction. Its financing was combined and leveraged with the first sixplex of its type located across the street for a total of 36 units in six buildings.



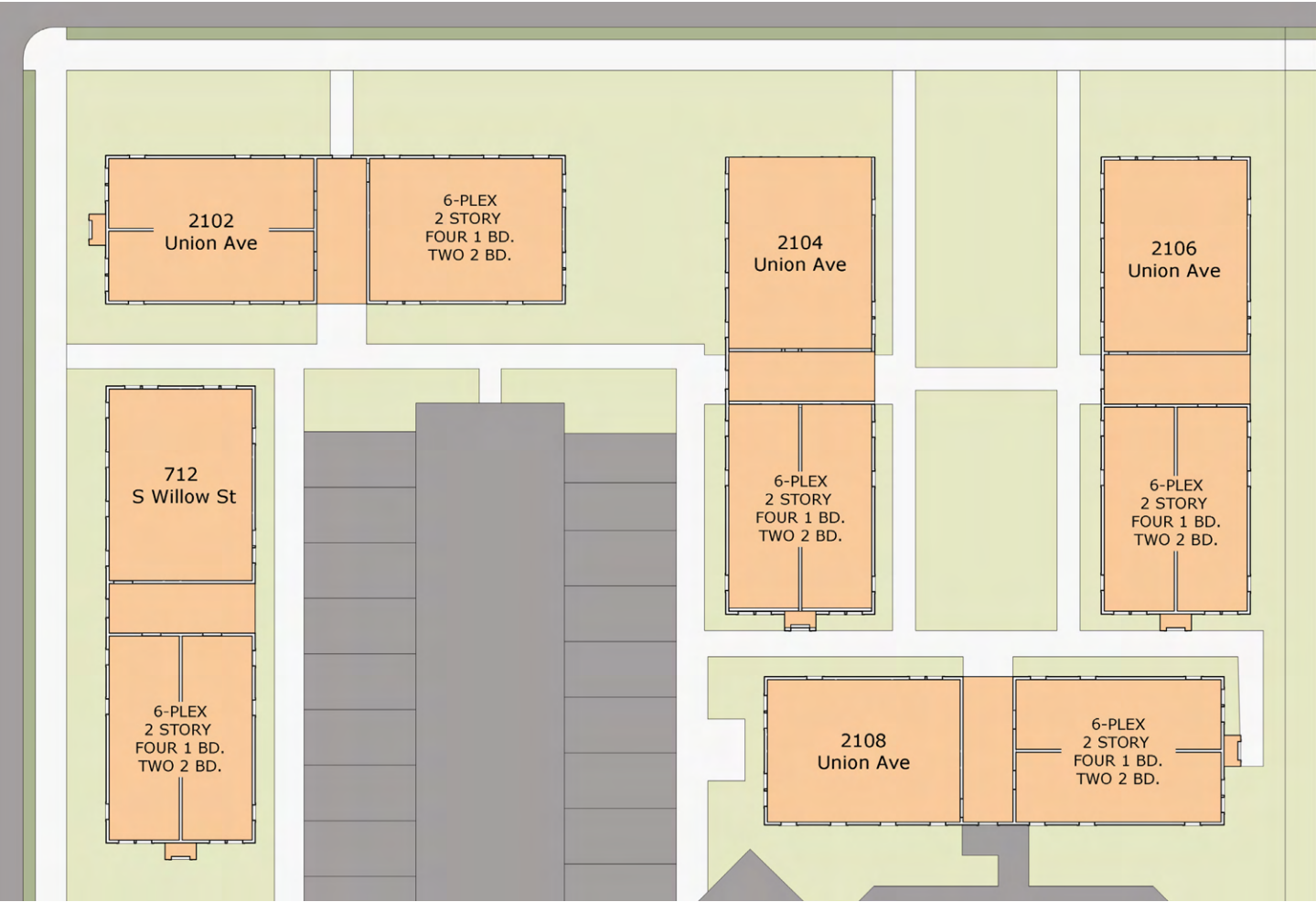
Sixplex courtyard on Union Ave



Finished Sixplex on Union Ave

Project Costs (2102 Union Ave)		Equity and Debt	
Land Costs	3 %	Construction Loan	80 %
Hard Costs	83 %	Land Value	3 %
Soft Costs	14 %	CNE Cash/Other Equity	2 %
		Home Funds	10 %
		Foundation Grants	5 %

Union Ave Sixplex Court



Union Ave Sixplex Court Site Plan



Finished Sixplex Court on Union Ave



Multiplex Court Prototype

Two 10-plexes flank a center 12-plex to provide an alternative site plan to a typical double-loaded corridor style building.

The 12-plex is a full three stories with triple height front porches, and the 10-plex is 2.5 stories, with the top units designed around roof dormers. The cluster of buildings can assimilate itself seamlessly with lower scale neighboring buildings.

Prototype Specs:

Architects:

Kronberg Urbanists and Architects

Current Locations: Proposed for 2003-2007 Bailey Ave

10-plex - Unit A and B: 540 SF

10-plex - Unit C: 600 SF

10-plex Total SF: 6028 SF

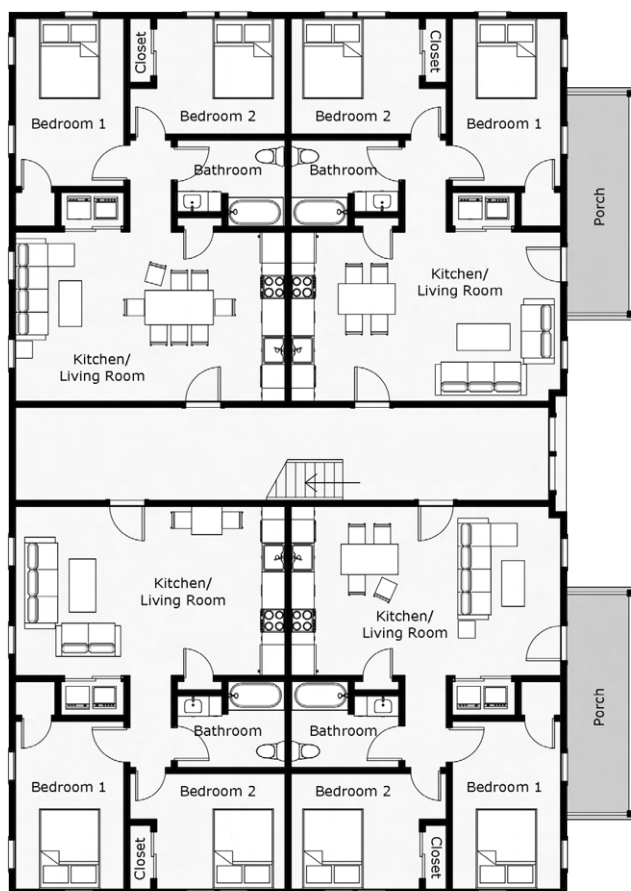
10-plex Footprint: 71' wide, 40' deep (includes porches)

12-plex - Unit A: 790 SF

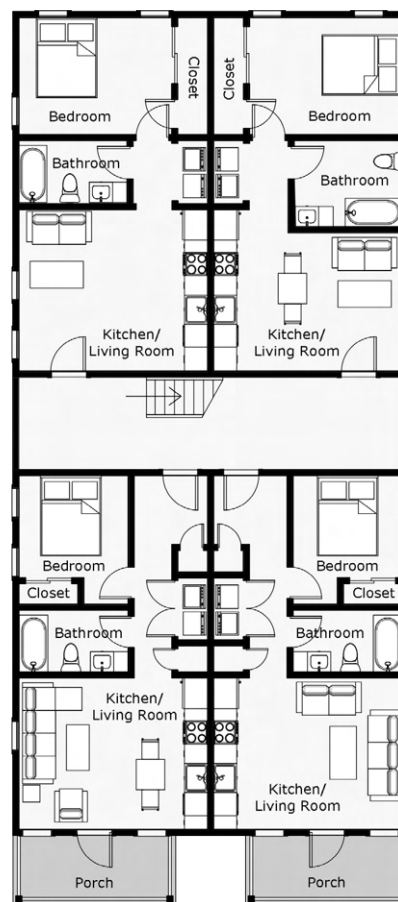
12-plex Total SF: 9480 SF

12-plex Footprint: 76' wide, 54' deep (includes porches)

Number of Buildings on Lot: 3



12-plex ground floor plan

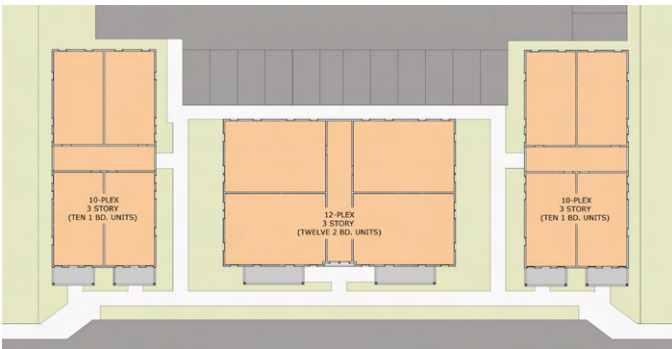


10-plex ground floor plan

Multiplex Court

The 10-plex provides 1-bedroom units and 12-plex provides 2-bedroom units. This multiplex cluster contains a mix of units while providing at least half the units with a direct outdoor space. The 12-plex is a simple set of stacked flat apartments, with the street facing units each having a porch. The 10-plex can flex to have either front or side porches to fit the site availability or street context.

This 32-unit project with centralized parking and utilities is currently being financed and is scheduled for completion in 2024. It will feature seven units, which will be income-restricted at 60% AMI or lower.



Multiplex court site plan



12-plex building render



Multiplex court isometric

Project Costs		Equity and Debt	
Land Costs	5 %	Construction Loan	68 %
Hard Costs	79 %	Land Value	5 %
Soft Costs	16 %	ARPA Funds	8 %
		Home Funds	9 %
		Foundation Grants	10 %



Missing Middle Housing Process



Introduction

CNE and Foundation Partnerships

Chattanooga has benefited from having strong private foundations and a nonprofit community development corporation. The Lyndhurst Foundation, the Benwood Foundation, and Chattanooga Neighborhood Enterprise share a goal of boosting financial prosperity for Chattanooga residents by enhancing Chattanooga's urban environment. For thirty-seven years, the team at CNE, supported by the foundations, has been building and rehabbing neighborhood-scaled housing in urban neighborhoods surrounding Chattanooga's downtown core. Unlike private-sector development, CNE's mission-driven development focuses on providing more affordable units as well as a path to wealth-building for many residents through homeownership.

The Chattanooga region, like others across the country, struggles with inadequate housing supply at affordable, below-market price points. There are dwindling infill opportunities in the urban core, and land prices are rising. Much of the previous infill development was either large apartment buildings, public housing projects, or single-family homes, with little in between.

In 2014, CNE had an opportunity to purchase thirty-two lots from Tennessee Temple University (TTU), a religious school in the Highland Park neighborhood, when it went out of business. The Lyndhurst and Benwood Foundations agreed to fund the land acquisition and assist in a redevelopment plan with CNE. The team sought to introduce a wider variety of new construction housing types that could accommodate greater density without deviating

from its historical commitment to the use of neighborhood-scale buildings. Through a coordinated strategy of leveraging human and monetary resources, the partners set out to systematize the design and construction process to scale up the Missing Middle infill strategy.



A Vision for New Middle-Scale Infill

Redevelopment of the TTU campus sites was challenged by several geographic constraints. The campus was located on the cusp between the Highland Park and Ridgedale neighborhoods near Willow, Bailey, and Union Avenues just east of downtown Chattanooga. The lots had originally been residential but had been cleared for university dormitories, tennis courts, and parking lots. Some had been sitting vacant for years. The partnership saw the opportunity to rebuild the fabric of the neighborhood through infill development that was denser than single-family homes but less than mid-rise apartments. The site was well-suited to a Missing Middle infill project that would help re-establish the neighborhood structure.

Prior to this development opportunity, in 2010, Daniel Parolek a principal at Opticos, coined the term Missing Middle Housing, transforming the national conversation about the need for more diverse housing choices at affordable prices. The Congress for New Urbanism was also discussing how best to preserve, design, develop, and restore mixed-use and walkable neighborhoods. Chattanooga saw the opportunity to expand its historical infill development work and apply these Missing Middle concepts to the Highland Park and Ridgedale neighborhoods by introducing new, neighborhood-scale, multi-family prototypes that could work in conjunction with single-family types that were the principal components in CNE's toolkit for urban neighborhood revitalization.



Urban Design rendering of Bailey Avenue Projects presented in Winter 2017 during rezoning meetings.

Missing Middle Design

Neighborhood Meetings

CNE collaborated with the Chattanooga Design Studio to hold a neighborhood meeting to discuss the types of housing that would be appealing to residents. Christian Rushing from the Design Studio presented a framework of different housing types that could be accommodated by the scattered lots that CNE purchased. Some neighbors expressed strong feelings that they only wanted single-family homes. Others wanted to focus on multi-family

and mixed-use housing because it would bring the density needed to support neighborhood businesses, restaurants, and coffee shops. As is common in neighborhoods undergoing economic revitalization, these points of view were often contentious in the beginning. The neighborhood meetings were insightful and educational for CNE as they began to assess the best path forward.

The design team agreed it made sense initially to develop single-family, for-sale homes on some of the single, stand-alone lots. A larger,

three-story, forty-nine apartment building made sense on six contiguous lots on Bailey Avenue, the main arterial street. The remaining lots were identified as appropriate Missing Middle sites for six-plexes and a small cottage court. These smaller building types fit well into the neighborhood context and coalesced the neighborhood support for denser development.

To create a roadmap for the Missing Middle development, CNE and the Lyndhurst Foundation contacted Jim Kumon of Incremental Development Alliance (IncDev). IncDev organized a team that included Eric Kronberg of Kronberg Wall Architects and Eric Brown of Brown Design Studios, as well as Incremental Development Alliance faculty Bruce Tolar, John Anderson, and David Kim. This design team had experience designing and constructing 21st century middle scale, multi-family housing and created a new set of prototypes that matched the walkable urban form of the neighborhood and provided a diversity of unit sizes.



Charrette

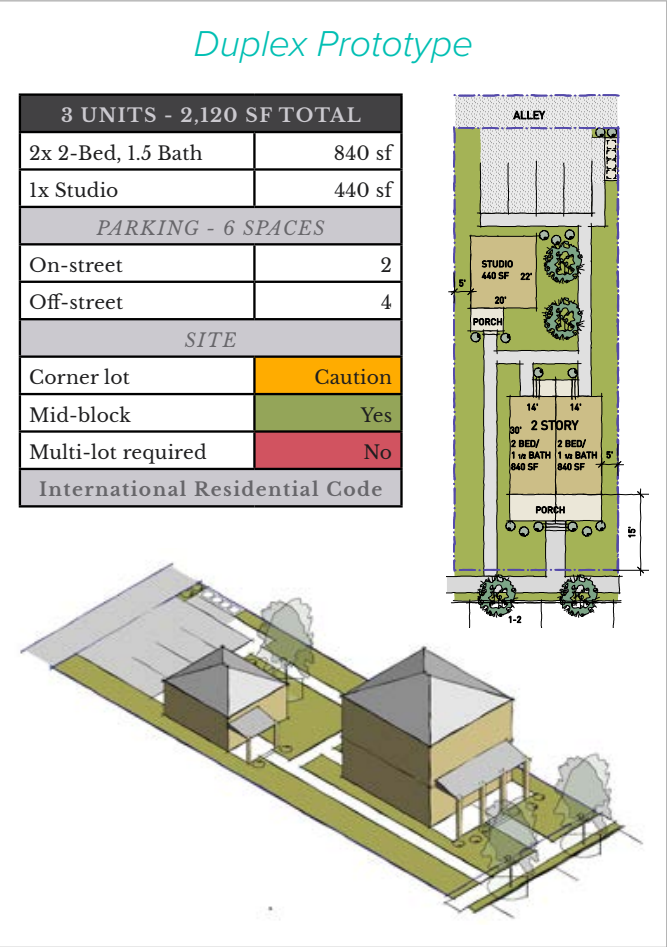
In August 2016 the project team held a design charrette to create new prototypes for Missing Middle housing in Chattanooga. The team members brought with them substantial knowledge about the design, zoning, financing, and constructability of Missing Middle housing around the country. Led by CNE staff, the team also conducted a drive-by survey of traditional

Chattanooga neighborhoods to find existing examples of Missing middle buildings that could inform new prototypes. They connected with local contractors and visited construction job sites nearby to get an understanding of the local construction costs, timelines, and general processes. The team also met with city administrators to share draft plans, discuss local zoning and development regulations, and identify red flags that could preclude new development. The team sought to improve the quality and functionality of the prototypes to create better and more diverse housing than the zoning rules tended to support. They worked with the city to identify areas of flexibility within the existing regulations but did not constrain the design approach solely by those existing rules.

The main goal of the charrette was to create a catalog of prototype buildings and plans that could encourage better architecture in the Chattanooga development community. The proposed design concepts, while inspired by existing Missing Middle buildings in Chattanooga, met modern-day consumer preferences as well as current building code standards. The team identified four building categories: live work, two to four-unit residential, six to twelve-unit residential, and twelve to eighteen-unit residential. In each category, there were many different iterations of building designs and floor plans along with 3D models and site plans that illustrated how each building would fit on a lot. Using this catalog of types, the project team created a concept layout that illustrated how building types matched with the appropriate lots based on context and zoning. The report, entitled Missing Middle Housing Types for Chattanooga, was published in November 2016 (and is available on CNE's website at www.cneinc.homes).

One premise of the initiative was to demonstrate how urban neighborhoods with a variety of building types could provide homeowners with more affordable price points. CNE built single-story homes on thirty-foot-wide lots to provide an even more affordable price point for first time home buyers than the middle level homes on the typical fifty-foot-wide lots. By providing

a range of price points, CNE was able to offer home ownership opportunities to a wider variety of buyers.



Site Planning, Zoning, and Stormwater Management

The next step in the design process was to create a site plan for the Ridgedale node on Union Street. Jim Kumon (IncDev) and Eric Kronberg (Kronberg Urbanists + Architects) worked with CNE to develop the prototypes created during the charrette and then decide what building types would be constructed first. The first two projects selected for implementation included five six-plex buildings in a courtyard arrangement and a narrow single-family home that could be replicated on multiple lots.

After the Ridgedale Node concept plan was completed in early 2017, Bob McNutt from CNE brought the plan to the Regional Planning Commission to discuss how to make it work within the zoning code. McNutt shared the vision for the overall site with the RPA staff and the challenges with the existing code. Since there was no residential zoning that allowed Missing Middle types, CNE applied for Urban General Commercial (UGC), which allowed for a built form that fit the neighborhood context. UGC eased the setback and parking requirements, but it required a commercial building code, not residential, including sprinklers. Any building over three units had to go through a more time consuming commercial permitting process, resulting in a more detailed review of the six-plex buildings.

The small-lot, single-family houses were re-zoned Residential Townhouse Zero Setback (RTZ), which allowed the 30'-wide lots to accommodate modest single-story homes. They were neither "townhouses" nor "zero-lot line," but that designation worked best. Sometimes an odd zoning designation works best.

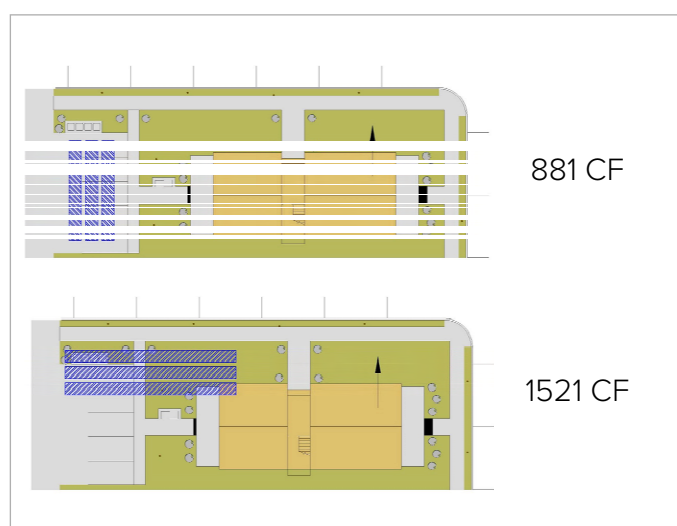
To better understand the impact of city stormwater requirements on the prototypes, design team engineer Paul Flippo prepared a report called Small Site Stormwater Analysis. While Missing Middle multiplexes were often the same size as large single-family houses with the same fixture count, multiplexes had to follow complex, costly, and space-consuming

Excerpt from Missing Middle Housing Types for Chattanooga



stormwater rules. In contrast, a single-unit building had no stormwater requirements. This created a massive bias and imbalance toward building only new single-family housing as the cost of the stormwater system requirements could add 10-20% to the construction cost. Two main workarounds were subsequently devised to make the prototype projects more feasible. The first is limiting the amount of site disturbance to 5,000 sf to avoid triggering any requirements, and the second is grouping several multiplex buildings onto a single site so they can share the considerable costs of required stormwater facilities. After numerous projects, no changes have been made by the city to right-size the actual requirements.

Excerpt from Small Site Stormwater Analysis



This diagram depicts the size of different stormwater infrastructure, as required by different calculation methods required stormwater storage.

Construction Documents

CNE contracted local and regional architects to refine the prototype plans to create reusable construction document sets. The charrette created a clear building footprint, elevations, and site plans. CNE hired a member of the design team, Eric Kronberg, who already understood many of the idiosyncrasies of the building and

zoning codes, to site prototype buildings on new lots, which reduced the overall design fees due to pre-negotiated lower repeat use fees. Urban Design Associates provided concept imagery and building guidelines for the first proposed buildings to be developed, which included the foundational six-plex design that has subsequently been adapted to various configurations and site constraints.

Once a prototype has been built, CNE is then able to use the same building floor plans with slight exterior alterations on subsequent projects. CNE can optimize efficiency by utilizing the same kit of parts, footprint, and unit layout, all the while introducing subtle variations in facade design to create diverse and distinctive exterior appearances. Reusing the same basic designs also lowers CNE's soft costs per building while still resulting in high-quality designs.

Each time a prototype is built, CNE tweaks the plans to eliminate glitches for the next time. Lessons learned from the early projects are incorporated and refined in later projects. One of the early six-plex projects did not include a front porch, which was revised in the next version to feature a front porch that provided a better transition between the public and private realms. Another area of modification was to alter a design that used PTACs for heating and cooling to mini-split units with ERVs in the second iteration of that building type.



Constructing Missing Middle

The Chattanooga construction industry is largely bifurcated into the construction of single-family houses or larger-scale commercial buildings. The commercial contractors were too expensive on a per unit basis for a small project like a six-plex. Small residential contractors (and their subs) were less expensive but did not have the capacity to build larger projects. As part of its commitment to local economic development, CNE identified small homebuilders and subs who wanted enhance their capacity by learning how to build middle scale buildings. They could build a six-plex at a more affordable price point if they could learn to navigate the commercial building code.

During the permitting and bidding process it was extremely important to expand small contractors' understanding of how to build Missing Middle buildings to avoid delays and failed inspections. Small residential contractors who think a Missing Middle project is just “a big house” are likely to underestimate the City's requirements for a building permit—a site plan and storm water calculations from a civil engineer, MEP drawings for mechanical systems, sprinkler specs for a commercial water line—that are not normally required for residential projects. In addition, residential contractors generally use subs that are less familiar with commercial building codes, particularly for fire-rated walls and floors that separate units, sprinkler systems, and utility connections. Inadvertent miscalculations can cause delays and flunked inspections, costing time and money.

Some construction challenges were the result of improved design as architects learned more cost-effective options. The biggest lesson learned from building the prototypes was that the ducted VTAC units were a suboptimal HVAC solution with ductwork in the trusses that were dampened to maintain a fire barrier. Future



projects instead used the mini-split units with an ERV on every floor. It is much easier to make room for ERVs upfront than it is to try to retrofit space for them later. Due to the mild climate, buildings are typically all electric. The city allowed one cut in the street for water, sewer, storm, and gas since Bailey is classified as a state highway. The utilities were then routed through the front yard, saving the cost of four cuts in the street. A two-inch water main was originally specified to serve the fire sprinkler system, which was reduced substantially after negotiations with the city fire marshal.

The development of the Vance Avenue cottage court posed significant challenges. These complexities arose from zoning and permitting issues related to the site, which consisted of five small single cottages on two parcels but was treated as a commercial project. The rezoning process was extended beyond a year due to the unfamiliarity of permitting staff with such a project. Initially, they directed CNE to use a specific zoning type, which received Planning Commission approval. However, after CNE had already progressed significantly with the building

permit process, the permitting staff reversed their stance, necessitating a complete restart of the rezoning process.

Additionally, because the project was categorized as commercial, the Fire Marshal mandated that the rear three cottages be equipped with sprinklers. This decision stemmed from concerns that fire trucks couldn't access them adequately from the street, and the alleyway was deemed too narrow. Furthermore, the city imposed a requirement for an underground stormwater retention facility on-site due to the project's inclusion of more than four units. Local regulations stipulated that four or more units triggered the need for comprehensive civil engineering and stormwater detention measures.

The frustrating aspect of this situation is that CNE could have constructed two 3-bedroom, 2-bathroom houses with two accessory dwelling units (ADUs) on the same site, achieving greater density without incurring the additional \$75,000 in expenses associated with meeting commercial requirements.



Financing Missing Middle

Foundation Commitments

The strength of the ongoing partnership between the Lyndhurst Foundation, the Benwood Foundation, and CNE has been instrumental to the success of the Missing Middle development initiative. The foundations have granted funding for property acquisition, environmental remediation, planning and site design, architectural design, and project equity. These are the most difficult parts of development to fund and must be firmly in place to secure bank financing at later stages.

The foundations also sought to optimize the use of their funds by focusing early investment on planning and design. Using a prototype approach, CNE was able to map out development strategies that could be applied to all the lots in Highland Park and Ridgedale. Rather than dedicating initial funding to expensive capital improvements such as sidewalks, the focus on planning and design yielded a set of prototypes that was much more strategic, tactical, and ultimately more transformative, providing guidance for several years of incremental development. The prototypes outlined how to add density gradually with smaller, less costly Missing Middle

buildings that reduced the capital funding needed at any point in time.

CNE's approach to financing Missing Middle projects has been relatively simple and straightforward. Unlike many affordable housing developments that are financed with Low-Income Housing Tax Credits (LIHTC), the Missing Middle buildings have been financed with a combination of conventional bank loans, equity, and HOME funds. CNE was able to secure bank financing at Prime minus four due to a special tax incentive offered by the state of Tennessee's Community Investment Tax Credit program. This meant that until July 2022, with the Prime rate at 4%, CNE paid no interest on any of its debt, which translated into considerable (interest) savings on its projects. Project equity is typically a combination of foundation funds, HOME funds, and CNE funds. CNE's equity comes from previous property revenue, recycled foundation funds, and the increase in land value between purchase and development.

CNE purposefully avoided the use of LIHTC funding but felt that HOME funds made sense for the Missing Middle program. Most of the projects received HOME grant funds awarded by the city of Chattanooga. This enabled CNE to make 20% of its Missing Middle rental units affordable to households at 50% - 60% of Area Median Income (AMI). The overall equity contribution was usually 25-30% (including appreciated land value after acquisition) of the total project cost, which was necessary to reach the bank's Debt Service Coverage Ratio (DSCR). DSCR was the prominent determinant of debt limits in project financing because the net operating income was limited by the rent caps needed to meet specific affordability levels. The straightforward financing structure made the predevelopment to closing process faster and less complicated.

Thanks to earlier foundation funding, CNE was in the fortunate position of having cash on hand to fund predevelopment costs and equity requirements on its first project, a six-plex development at 2015 Union. This strategy allowed CNE to move faster and position the building as collateral for the five-building six-plex

across the street. The subsequent projects had fifteen-year term loans with a two-year interest-only construction period and thirteen years of principal and interest using a twenty-five-year amortization period.

HOME Funds

The city of Chattanooga receives funding from the Department of Housing and Urban Development (HUD) through the HOME program. HOME grants are provided to state and local governments to establish affordable housing options for low-income households. Within CNE's projects that utilize HOME funds, the housing units are specifically designated for renters whose income falls at or below 60% of the Area Median Income (AMI). Additionally, if more than five units receive HOME funding, 20% of these units must be allocated to individuals or families with income at or below 50% of AMI. It's worth noting that the utilization of HOME funds introduces extra time and expenses to the projects due to a comprehensive environmental review process that is triggered upon funding receipt, contributing to project costs and extending the review duration.

CNE, as a nonprofit organization dedicated to affordable housing, is committed to maintaining affordable rent levels. While the units not subject to HOME funding are aimed at households with an income target of 80% of AMI, the impact of rising interest rates is resulting in rent increases that are pushing the income limits for new units to the range of 80% to 90% of AMI. Out of the total of 189 rental units, 40 are reserved for individuals whose incomes are at or below 60% of the Area Median Income (AMI), ensuring that these units remain affordable for those in need.

Undertaken Projects

CNE's dedicated efforts to revitalize the neigh-

neighborhood have led to the completion of various projects. They have constructed 28 single-family homes, rehabilitated an aging post office apartment building, and introduced nine distinct "Missing Middle" prototypes in the Ridgedale and Highland Park neighborhoods. These prototypes encompass two modest-sized apartment buildings, a duplex, a four-plex, two six-plexes, and a five-unit cottage court. Furthermore, they have plans to commence the construction of a ten-plex and a twelve-plex in late 2023. In total, they have successfully developed 189 rental units and 28 single-family homes, spread across 50 different lots.

Two noteworthy projects within this initiative consist of mid-sized three-story apartment buildings. One of these buildings comprises 49 units, while the other contains 27 units. Despite exceeding the traditional definition of "Missing Middle," great attention has been devoted to ensuring that these structures seamlessly blend into the surrounding urban environment.

In the Highland Park node, CNE constructed fourteen single-family homes between 2015 and 2017, primarily situated on Kirby Avenue. Three additional homes were located on Bailey Avenue, with one on Vance Avenue. The "Mai Bell I" project, completed in 2017, featured 49 rental units and two commercial spaces. The "Mai Bell II" project, finished in 2023, included five four-plexes and a twenty-seven-unit rental building on Union Avenue.

In the Ridgedale node, CNE's inaugural multiplex development took shape in 2018 with the establishment of a six-plex located at 2105 Union Avenue. Over the ensuing years, additional six-plexes were erected on Union Avenue and Bailey Avenue, culminating in the construction of eleven buildings in total. To diversify the range of available housing, seven single-family homes were built for sale on typical 50' lots, while six others were constructed on smaller 30' wide lots that were re-platted from larger parcels. This strategy contributed to maintaining an affordable price point for these homes. In 2022, CNE expanded its portfolio by adding three duplexes,

two of which were located on Duncan Avenue, and the third on Kelly Street. In early 2023, they successfully completed a five-unit cottage court on Vance Avenue. Looking ahead, CNE has plans to commence the construction of a twelve-plex and two ten-plexes in 2024.



Conclusion

Missing Middle Housing a Successful Tool for Neighborhood Revitalization and Affordable Housing

Through its innovative and ambitious Missing Middle Development Initiative, CNE has demonstrated its unwavering commitment to revitalizing urban neighborhoods and creating economically diverse communities. Over its thirty-seven-year history, CNE, supported by the Lyndhurst Foundation and Benwood Foundation, has spearheaded transformative projects that include a wide range of building types, from single-family homes to multi-unit apartment buildings.

By introducing Missing Middle housing concepts, CNE has filled a crucial gap in the housing market, offering affordable options that gently increase density and enhance neighborhood character. Their ability to navigate complex zoning regulations and creatively interpret existing codes has enabled them to use small infill lots effectively, revitalizing neighborhoods on a lot-by-lot basis.

With a focus on affordability, CNE's financing structure has been designed to make homeownership and rental housing accessible to a broader range of income levels. By eschewing federal tax credits in favor of HOME funds and strategic partnerships, they have been able to insert smaller apartment buildings into neighborhoods while providing rental units at 50%-80% of the Area Median Income (AMI), meeting the needs of the community.

CNE's dedication to good design and community-oriented architecture has inspired private developers to follow suit, creating a positive ripple effect in the Chattanooga development community. From 2017 to the projected completion in 2025, CNE will have constructed over 249 hous-

ing units on scattered sites in the Highland Park and Ridgedale neighborhoods.

This report stands as a testament to the transformative impact that thoughtful planning, creative financing, and a commitment to neighborhood revitalization can have on the well-being and prosperity of a community. Chattanooga's Missing Middle development history serves as a model for other cities to follow, showing that through collaborative efforts and visionary thinking, it is possible to create healthy and inclusive neighborhoods for all.

The Missing Middle Development Team 2016

CNE Staff

Martina Guilfoil, President & CEO

Bob McNutt, Real Estate Director

Jake Toner, Real Estate Development Consultant

Funding Partners

Macon Toledano, **Lyndhurst Foundation**

Jeff Pfitzer, **Benwood Foundation**

City of Chattanooga

Consulting Partners

Incremental Development Alliance -- Jim Kumon, David Kim, Bruce Tolar, John Anderson

Kronberg and Wall Architects -- Eric Kronberg

Brown Architects -- Eric Brown

Chattanooga Design Studio -- Eric Myers, Christian Rushing

Architects responsible for developing construction documents for prototypes

Lawrence Mathis -- Duplexes

Kronberg Urbanists & Architects -- Fourplexes; 10- and 12-plexes

elemi architecture -- Sixplexes; Narrow-lot Single Family; Cottage Court; 51-unit building

Small-scale residential contractors responsible for building missing middle projects

Scenic City Development -- Duplexes (2022)

RLP Construction -- Sixplexes; Cottage Court; 10- and 12-plexes (2020-2024)

Embark Project Services -- Single Family (2019-2020)

Innovative Construction -- Sixplexes (2018-2021)

Mountain City Construction -- Sixplexes in Union Ave Courtyard (2020); Small-lot Single Family (2019)

This book was made possible
through the financial support of
NeighborWorks America and the
Lyndhurst Foundation.

