

Andrews Mill Project

2021 AFFORDABLE HOUSING DEVELOPMENT COMPETITION
FEDERAL HOME LOAN BANK OF BOSTON



Acknowledgements

PROFESSOR	ED MARCHANT	Harvard University		
CLIENT/SPONSOR	JOE GARLICK	NeighborWorks Blackstone River Valley (NWBRV)		
MENTORS & PARTNERS	SHALINIE PERSAUD	ICON Architecture	JOHN O'HEARNE	O'Hearne Associates
	GABRIELLE AITCHESON	ICON Architecture	JOHN FLAHERTY	Grow Smart RI
	ERIC SHORTER	Rhode Island Housing	CYNTHIA ROBERTS	Engage North Smithfield
	JIMMY SU	Arup	ALEKSANDRA NORTON	Engage North Smithfield
	PATRICK MCCAFFERTY	Arup	MEGAN STAPLES	Engage North Smithfield

NeighborWorks & Harvard/MIT

NWBRV is a nonprofit HUD approved Homeownership Center. NWBRV helps families attain home ownership & provides financial decision-making guidance during the home buying process.

Project Team



CLAIRE WANG
Harvard University GSD
Master in Urban Planning Candidate



JULIAN HUERTAS
Harvard University GSD
Master in Urban Planning Candidate



DAVID BEMPORAD
Harvard University GSD
Master in Urban Planning Candidate



SEOYOUNG LEE
Harvard University GSD
Master in Architecture Candidate



HANXIN XING
Harvard University GSD
Master in Design Studies, Real Estate



WENZHENG WANG
Harvard University GSD
Master in Urban Planning Candidate



JIYE HA
Massachusetts Institute of Technology
Master in Architecture and Real Estate Development



YOONJAE OH
Massachusetts Institute of Technology
Master in Architecture Candidate

Special Thanks

ISABELLE DUPARZ	Harvard University
PEGGY MORIARTY	Harvard University
DEBORAH KNAPP	Harvard University
YAMELIZ PARES	North Smithfield Resident

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A team consisting of eight graduate students representing the Harvard University Graduate School of Design (GSD) and the Massachusetts Institute of Technology (MIT) partnered with NeighborWorks Blackstone River Valley (NWBRV) to compete within the Federal Home Loan Bank of Boston's 2021 Affordable Housing Development Competition. The Harvard/MIT team worked throughout the Spring 2021 academic semester in partnership with NWBRV to submit this entry for the 2021 Affordable Housing Development Competition.

Executive Summary

From Extraction to Investment

The affordable housing redevelopment project site is a former textile mill, known locally as Andrews Mill, located at 765 Great Road in North Smithfield, Rhode Island. The mill currently lays vacant, but the founding of Branch Village over 200 years ago in North Smithfield can be attributed to this site and industrial enterprises using it from the late 18th to early 20th centuries. Andrews Mill has been a community anchor, yet throughout the years, a variety of owners used various industrial structures here, extracting wealth, and leaving. The people of North Smithfield and adjacent Woonsocket, however, have remained. **As such, it is time for this anchor to no longer extract but support and provide for the Northern Rhode Island community.**

“I love the peace here. The most important thing is to make all residents feel comfortable here.”
 - Yameliz, North Smithfield Community Resident

There are two primary goals for the adaptive re-use site of the Andrews Mill that this project seeks to achieve:

- 1 The first goal is to build a community anchor that brings people in through existing connections to Woonsocket, Providence, and Massachusetts - thereby providing opportunities for new and existing residents alike to have access to home ownership and employment.
- 2 The second goal is to actively invest in the Branch Village Community through new housing, commercial space, and infrastructure connections.

Through an innovative architectural, site planning, and financial strategy for adaptive re-use at Andrews Mill that provides affordable and market-rate units alike along with commercial & communal space, the site will serve as a) an amenity for those living on site and in the community, b) a housing opportunity for those across the region, and c) a connector to the amazing recreation space in the area.

Key Features:



Figure 1



Figure 2

Site Overview



Figure 3

Sited along the Branch River on a 32-acre parcel in North Smithfield, Rhode Island, the Andrews Mill Company Plant comprises three contributing buildings and three contributing structures related to the period of active occupation of the Andrews Mill Company (1918-1925), a textile manufacturer.

The location of the site - Andrew Mills - is located at 765 Great -Road in the Branch Village area of North Smithfield, Rhode Island. The location of the site is unique for several reasons:

- The site formerly was a wool textile mill that was built in 1918. The mill provided hundreds of jobs to the local community and saw a run of different owners throughout the years. The mill has been vacant since 1994 and was added to the National Register of Historic Places in 2018.

- The site is not located within a Qualified Census Tract (QCT) or Difficult Development Area (DDA). The closest QCTs are located in adjacent Woonsocket, RI, and the closest DDA is located in Bellingham, MA. As such, the site is not eligible for a basis boost.
- North Smithfield as a town has some current Low Income Housing Tax Credit (LIHTC) projects. However, in a similar vein to the QCTs, LIHTC projects are clustered in adjacent Woonsocket, RI.

Changing Hands of Ownership

1 Andrews Mill Company Plant | 1918-1936

Upon its initial construction, the mill was owned and operated by the Andrews Mill Company Plant in which it was used for the weaving and finishing of woolen cloth.

2 Uxbridge Worsted Company | 1936-1955

The mill transferred ownership in 1936 but remained as a working wool mill. A pump house and brick incinerator were built but, as they were not part of the mill's original construction, are considered to be non-contributing.

3 Tupper Corporation | 1955-1994

The mill transferred ownership yet again in 1955 and it was operated in accordance with the production of the globally-known Tupperware products. The site was sold in 1994 to a real estate company and has been vacant since.



SITE AND CONTEXT ANALYSIS

Figure 4

The front facade of Andrews Mill in 1918 (above) in relation to the same front facade in 2018 (below)



Figure 5

Cutaway view of a sawtooth-roofed textile weave shed from "Framing", William A. Radford, ed. (1917)

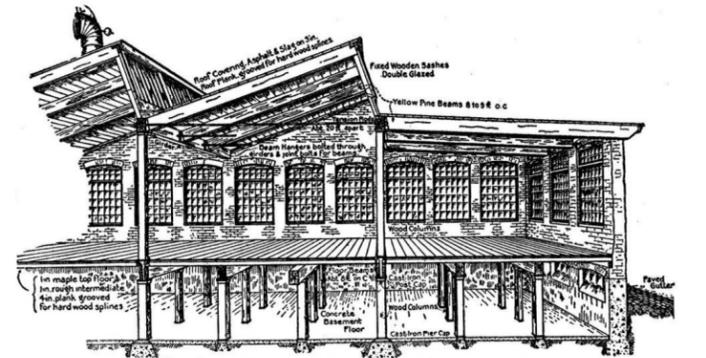


Fig. 158. Textile Weave Shed—Standard Mill Construction with Saw-Tooth Roof.

Figure 6

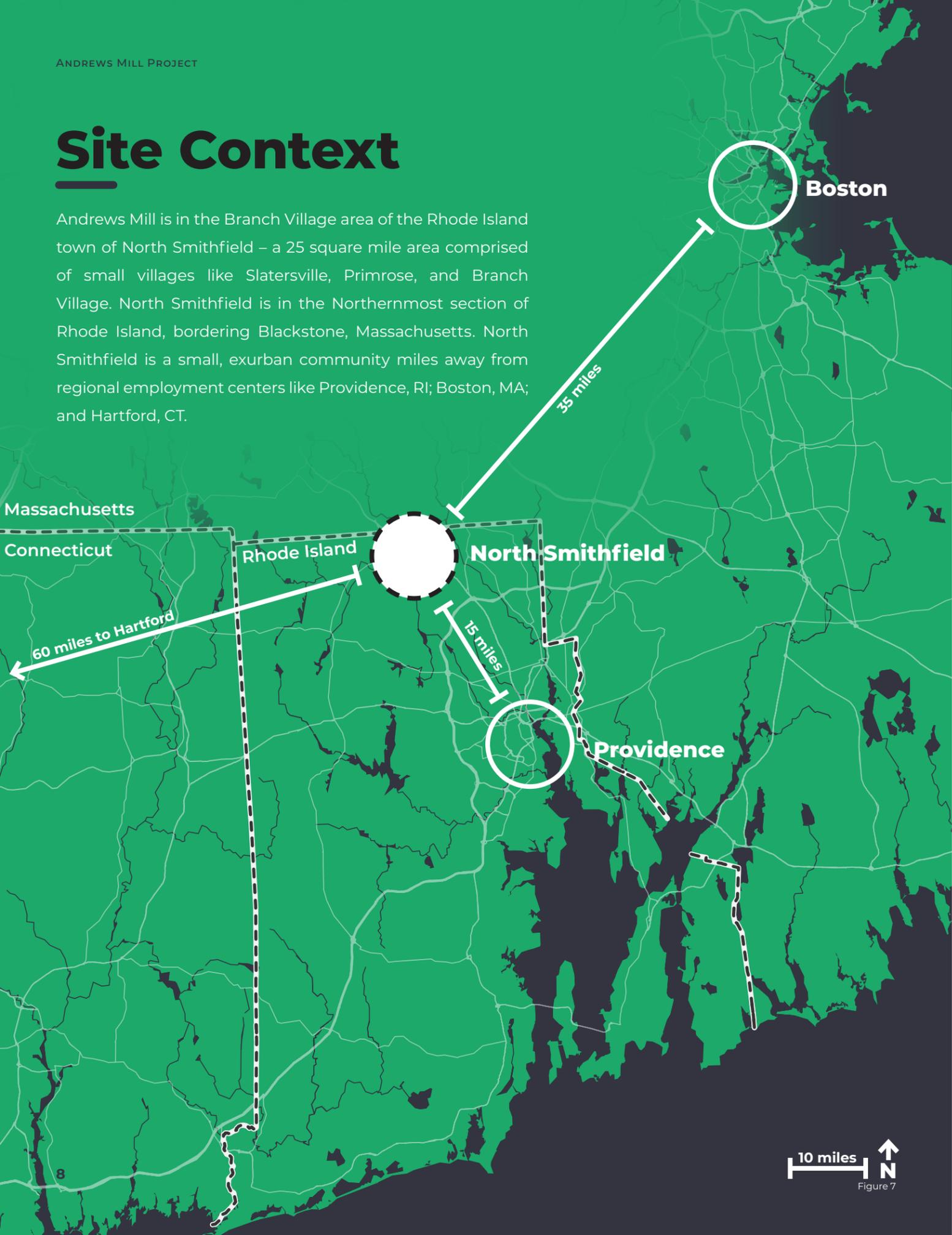
Historical Character and Integrity

Andrews Mill has seen a variety of owners in its 100+ year history since its original construction in 1918. The main contributing structures of the mill consist of the main mill building, the boiler house, the machine shop, gate structure, water tower, and pump house. The main mill building is one-story (not including basement), sits on a concrete foundation, and contains a sawtooth roof. This sawtooth roof is the stand-out architectural feature of the mill that was standard for French wool industry mills in the late 19th and early 20th centuries. The primary building materials used for the mill and its contributing

features were brick, wood, and concrete. Recently, the site was bought by Joe Garlick of NWBRV. For the past 20+ years, the site had been sitting vacant, and the intention of NWBRV upon acquisition was to turn Andrews Mill into a mixed-use space with market-rate residential, affordable residential, and commercial spaces. Through the AHDC competition, the goal for the Harvard/MIT team is to help NWBRV make this intention for Andrews Mill into a reality to serve the local North Smithfield Community.

Site Context

Andrews Mill is in the Branch Village area of the Rhode Island town of North Smithfield – a 25 square mile area comprised of small villages like Slatersville, Primrose, and Branch Village. North Smithfield is in the Northernmost section of Rhode Island, bordering Blackstone, Massachusetts. North Smithfield is a small, exurban community miles away from regional employment centers like Providence, RI; Boston, MA; and Hartford, CT.



10 miles
N
Figure 7

Branch Village in Context

While part of North Smithfield, Andrews Mill and Branch Village are closer geographically to the nearby City of Woonsocket. North Smithfield has insulated itself from the need for new investment and housing in Woonsocket through its administrative borders. Suppose one only analyzes the social context of Branch Village at the census tract or township level; they will see only a wealthy exurban community. In that case, one

entrenches arbitrary borders into their analysis and does not accurately show the Andrews mill context. Shown below, all the demographic indicators from the 2019 American Community Survey demonstrate the economic, racial, and opportunity segregation between Woonsocket and North Smithfield. Our analysis uses heatmapping of ACS data to remove the biases of arbitrary borders and shows the permeability of housing need in this region.

	North Smithfield	Woonsocket	United States
Population	12,413	41,603	324,697,795
Population/Sq. Mi.	503	5,240	86
Men/Women Ratio	.91/1	.94/1	.97/1
Median Age	48	37	38
65+ Percent	23%	14%	16%
White Population Percent	95%	74%	73%
Black Population Percent	2%	10%	13%
Asian Population Percent	1%	6%	6%
Hispanic Population Percent	5%	19%	18%
Monthly Gross Rent	\$1,370	\$912	\$1,062
Percent Driving to Work	91%	89%	85%
Percent taking Transit to Work	0%	2%	5%
Percent Walking to Work	0%	4%	3%
Percent Cycling to Work	0%	0%	1%
Mean Travel Time to Work	29.8	25.8	26.9
Bachelor's Degree or Higher	23%	12%	22%
Median Earnings	\$53,705.67	\$35,566.38	\$41,081.00
Below the Poverty Level	15%	21%	11%
Percent of Families with Children	37%	44%	41%

Figure 8

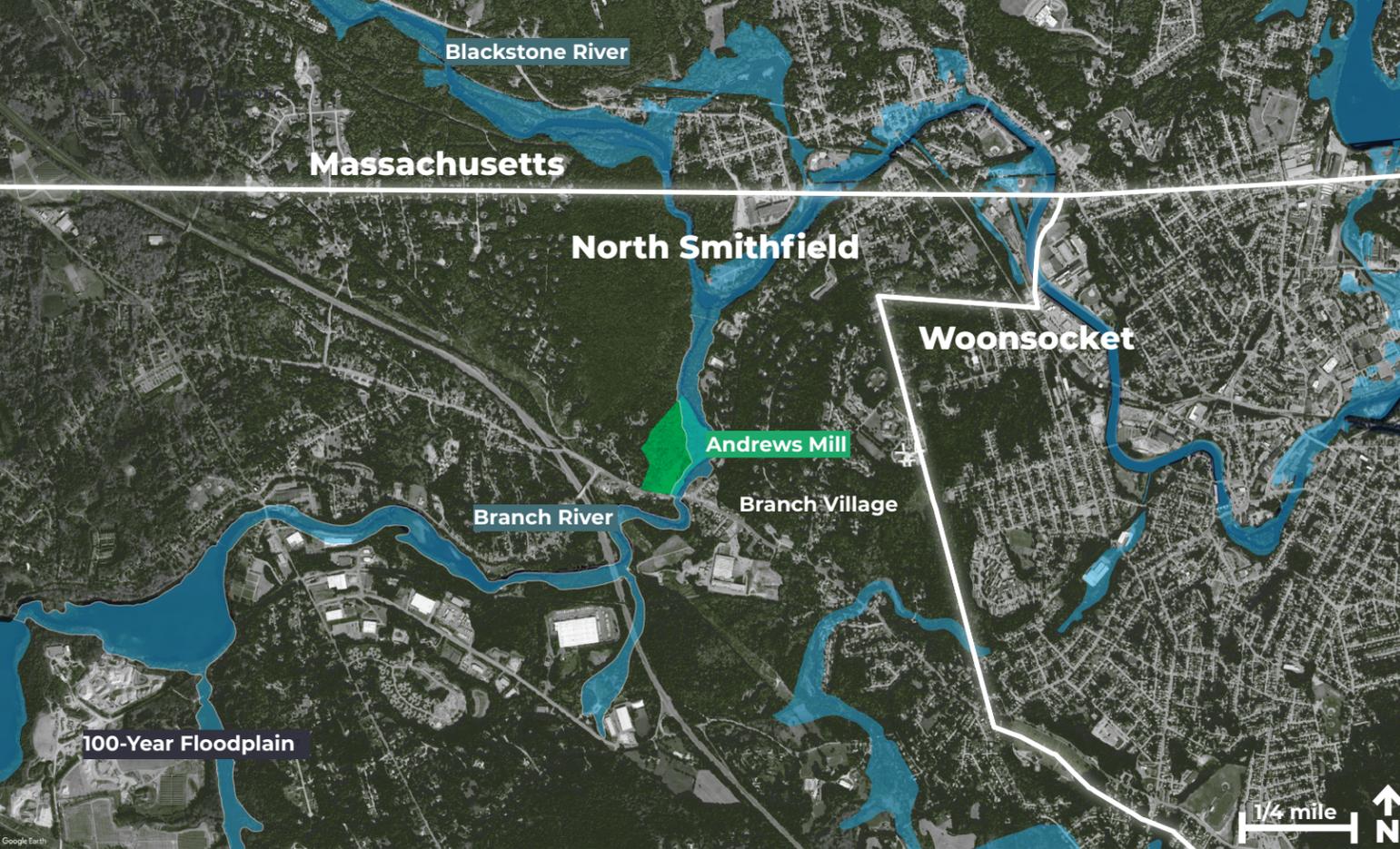


Figure 9

Social Context Analysis

Andrews Mill and Branch Village occupy a unique space between the white, wealthy, well-educated community of North Smithfield and the more dense, diverse, and working-class community of Woonsocket. While North Smithfield is 95% white, Woonsocket is more racially diverse, like the United States, with large Black and Hispanic populations. Woonsocket also has a greater youth population, and of the families in the region, Woonsocket's are 7% more likely to have children. On the other

hand, North Smithfield has a much higher elderly population and median age, with nearly twice the percentage of residents over 65, raising the median age of North Smithfield to a decade older than Woonsocket. Together, these statistics demonstrate the social and racial disparities between Woonsocket and North Smithfield. Due to its unique location, Andrews Mill has an important role in bridging these gaps and supporting often excluded, underserved residents in Woonsocket.

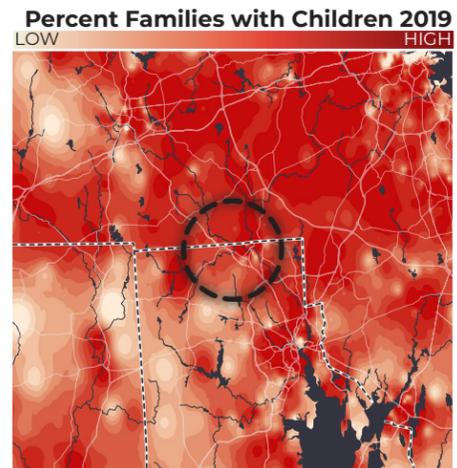


Figure 10

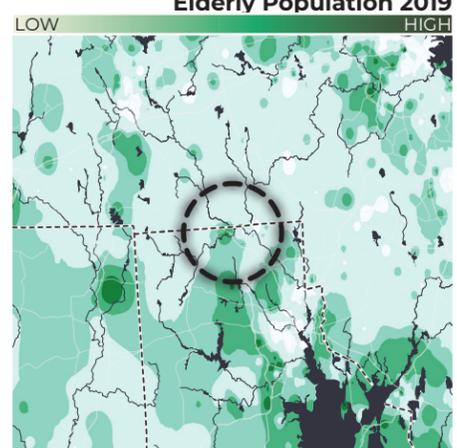


Figure 11

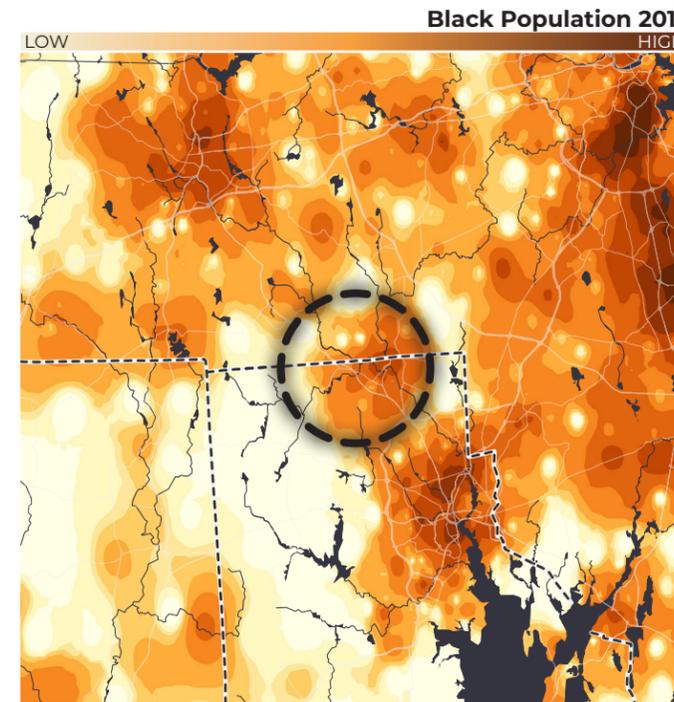


Figure 12

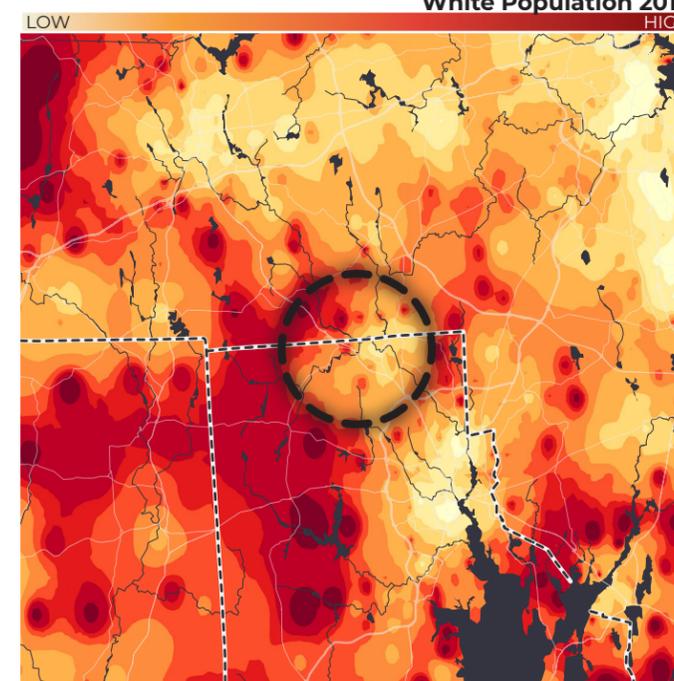


Figure 14

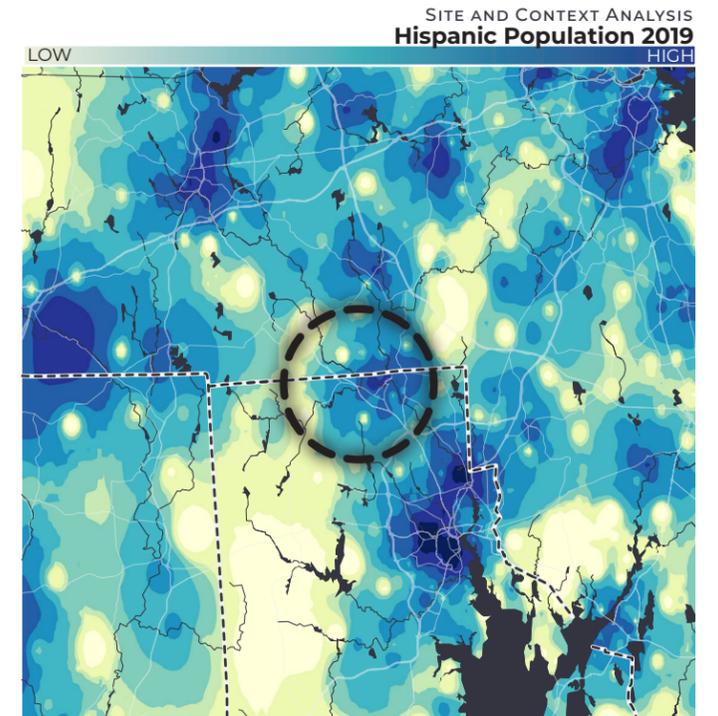


Figure 13

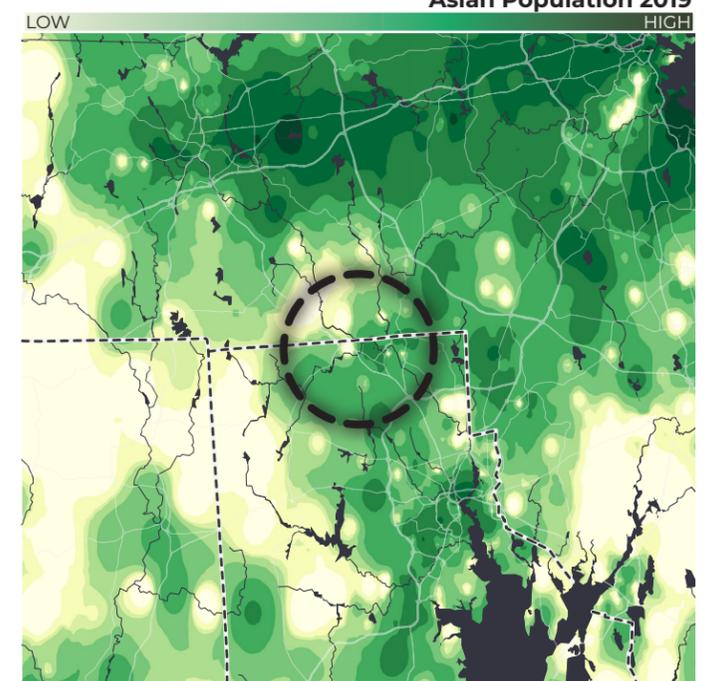


Figure 15

Analysis shows that North Smithfield, Rhode Island has racial and ethnic disparities in its traffic stop and search history.

- Central Connecticut State University
Institute for Municipal and Regional Policy
2018.

"Some families of color in North Smithfield have regularly experienced and report being victims of acts of interpersonal racism."

- Engage North Smithfield
in NRI NOW.



Figure 16

Housing Context and Affordability Analysis

The most powerful divide between North Smithfield and Woonsocket is their relative population densities. Despite being next door to one another and sharing state government regulations, Woonsocket is 10x more densely populated as North Smithfield. Woonsocket houses 5240 persons per square mile, while North Smithfield houses 503. This exclusion is embodied of population density is in the fact that, between 2014 and 2019, only 47 new housing units were built in North Smithfield.¹⁰

However, Woonsocket has also failed to provide new housing opportunities for residents, producing only 24 units between 2014 and 2019. Despite Woonsocket having much lower median housing costs, this lack of

supply has severely tolled its rental market – with rents rising 36% between 2016 and 2021.¹¹ Both Woonsocket and North Smithfield have a greater portion of their population below the poverty line than the national average. While gross monthly rents rise commensurately with median earnings in these townships, the 33% gap in income between Woonsocket and North Smithfield limits Woonsocket residents from leaving the city to adjacent communities – forcing them to pay more for living only a mile away. Further limiting Woonsocket’s residents’ mobility is the remarkable 100% gap in the percentage population with bachelor’s degrees or higher between Woonsocket and North Smithfield.

From 2014 to 2019, only 71 new housing units were built in Woonsocket and North Smithfield

- U.S. ACS 2019

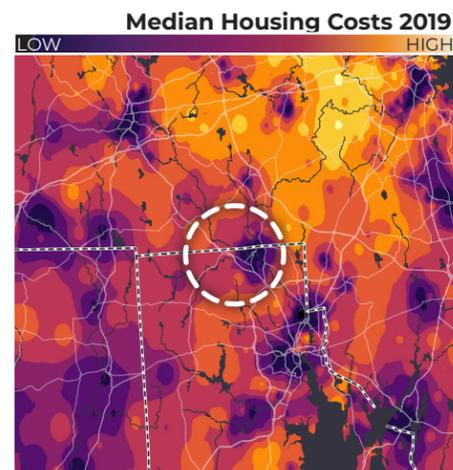


Figure 17

However, there are exciting changes in the cities’ approach to housing policy that can help this region provide for its residents. North Smithfield has rezoned much of Branch Village to support mixed-use developments.¹² Their new zoning designations allow for mixed-use commercial and mixed-use industrial plans on parcels in Branch Village. The city established these policies to:

- “Encourage mixed-income residential development with a variety of unit types.”
- “Provide for compatible uses and development densities, including limited residential, commercial, professional service, light industrial/ research, and institutional, as well as recreation and open space.”
- “Provide guidance and a framework for redevelopment and new growth that is sustainable.”

This policy supports new development in Branch Village by opening up previously limited parcels to new developments, pairing opportunities for work, living, and commercial amenities.

Much of Woonsocket is part of Qualified Census Tracts (QCTs) which allows them to garner higher scores for LIHTC (Low-Income Housing Tax Credit) applications. This fact has not gone unnoticed, with a dozen LIHTC properties in Woonsocket. Furthermore, LIHTC properties have also been successful in North Smithfield. The Gatewood and Colonial Village apartment properties are less than a mile away and provide more than 100 low-income units between them.¹³

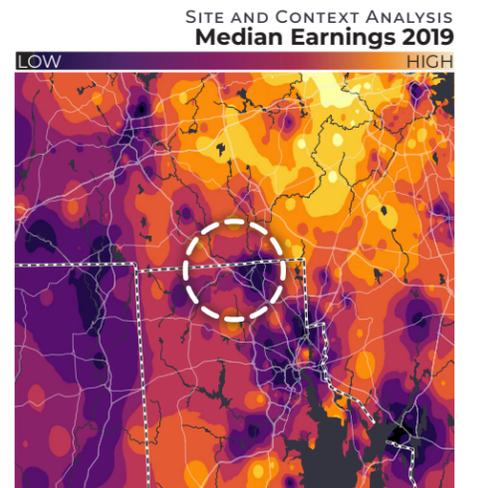


Figure 18

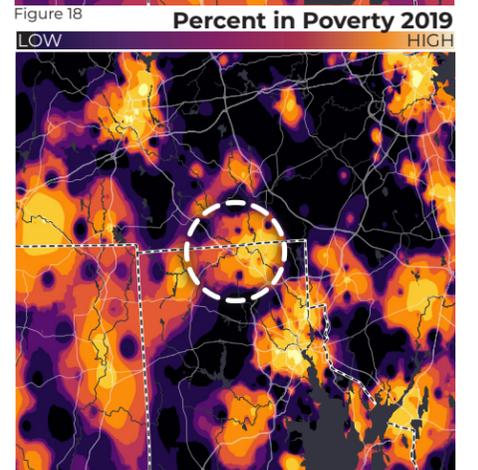


Figure 19

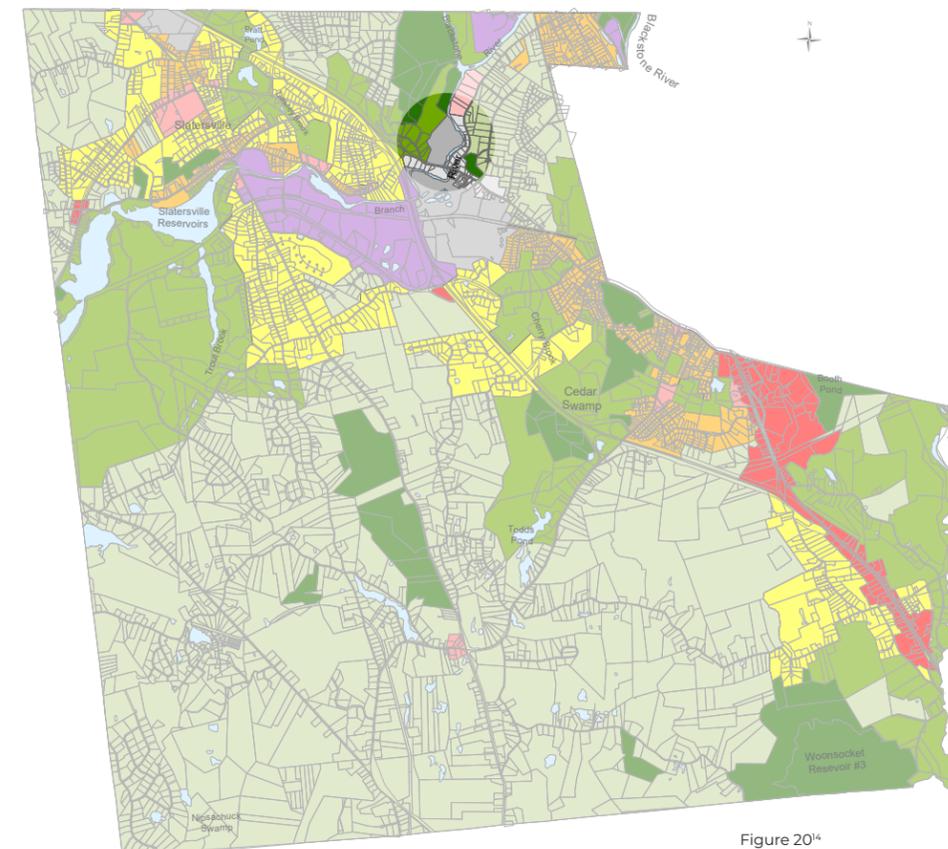
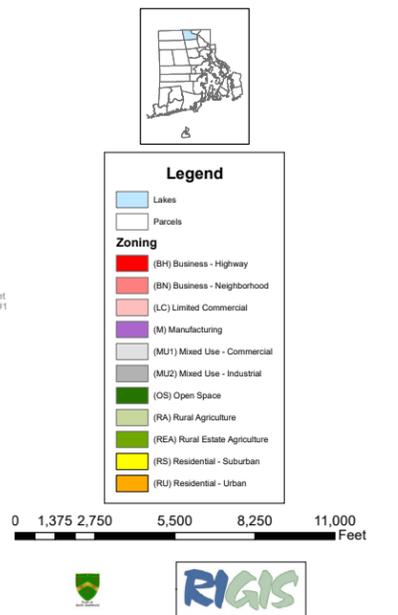


Figure 20¹⁴

Town of North Smithfield Official Zoning Map Effective April 1, 2019



Parcel data - Town of North Smithfield, RI
Road data - RIGIS
Map produced by Town of North Smithfield, RI 2019
Town of North Smithfield Comprehensive Plan 2019

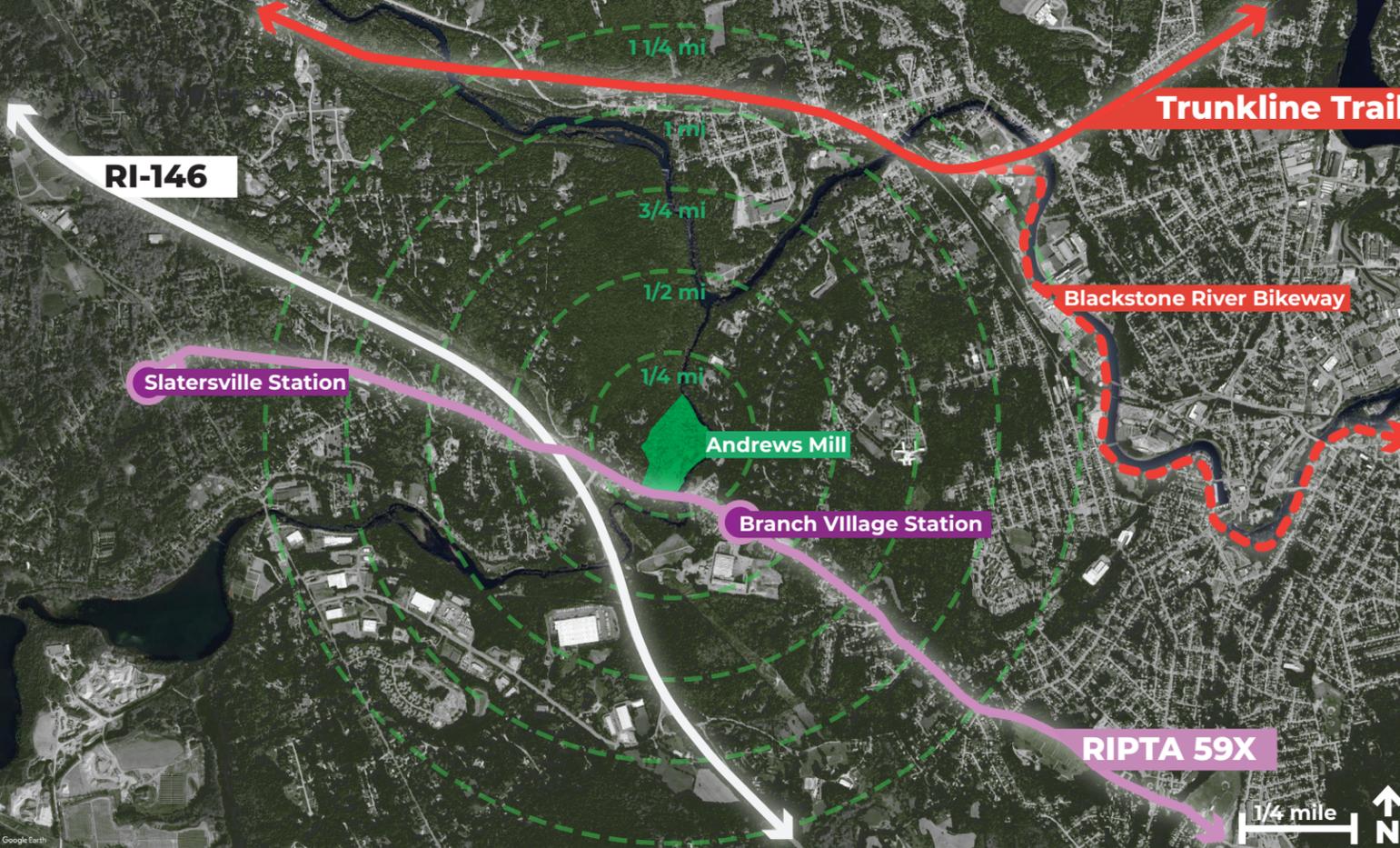


Figure 21

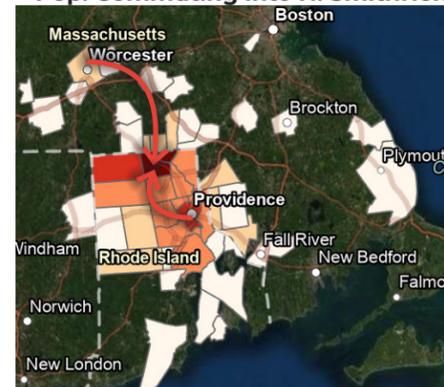
Mobility Context

Like much of the suburban and ex-urban United States, Woonsocket and North Smithfield are extremely car-centric places. In 2019, 91% of North Smithfield Residents used a car to commute to work, with no resident cycling to work and less than 1/2 of 1% commuting by public transit or walking. Woonsocket's workers commute similarly – 89% drive to work, 2% take transit, 4% walk, and 0% cycle. The RI-146 highway running through the North Smithfield Community incentivizes this transportation character and a built form that supports car usage through big-box stores with ample parking and non-existent

sidewalks.¹⁵ However, as with Housing, Branch Villages's mixed-use zoning aims to change this character, with its goals articulating a desire to “serve the residents of the district and adjacent neighborhoods while reducing the reliance upon the automobile.” and “provide a safe atmosphere for pedestrian and bicycle uses and a logical connection of destinations within and adjacent to the district.”

Furthermore, there are non-car mobility options in Branch Village. The RIPTA (Rhode Island Public Transit Administration) 59X commuter bus stops in the heart of Branch Village and runs

Pop. Commuting into N. Smithfield



Pop. Commuting out of N. Smithfield

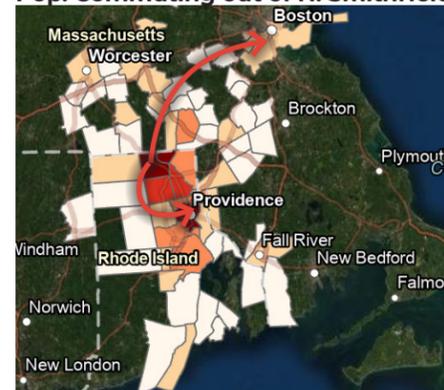


Figure 22

in the mornings and evenings directly to Providence, Rhode Island.¹⁶ For Cyclists, the Southern New England Trunkline Trail is an incredible cycling and walking amenity connecting to Woonsocket and is only one mile away from the Andrews Mill. In the Rhode Island Cycling Master Plan, the state has committed to completing the Blackstone River Bikeway connection to the Trunkline Trail, building a contiguous cycling path from Woonsocket to Providence.¹⁷ Finally, these alternative transportation modes are viable for many North Smithfield commuters, as most North Smithfield workers stay within the town's boundaries for their commute - those commuting to North Smithfield for work are most likely to come from Woonsocket.¹⁸ Many of these commutes are feasible for pedestrians and cyclists if there is adequate infrastructure to make walking and cycling safe, efficient, and comfortable. Overall, despite opportunities for non-car mobility, a lack of connectivity, frequency, and car-centric built-character make public transit, walking, and cycling non-viable transportation options, especially in North Smithfield.

“The majority of the community wants access to high quality recreation opportunities.”

- Aleksandra Norton, Engage North Smithfield¹⁹

Commuters Driving to Work 2019

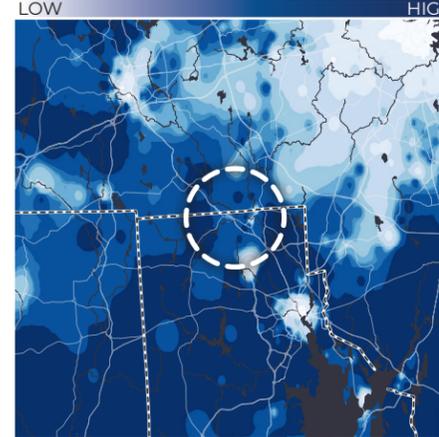


Figure 23

Walked to Work 2019

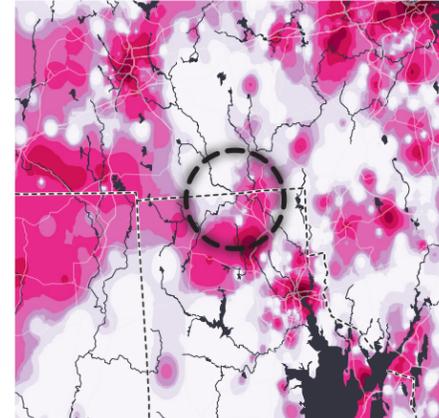


Figure 25

SITE AND CONTEXT ANALYSIS
Public Transit to Work 2019

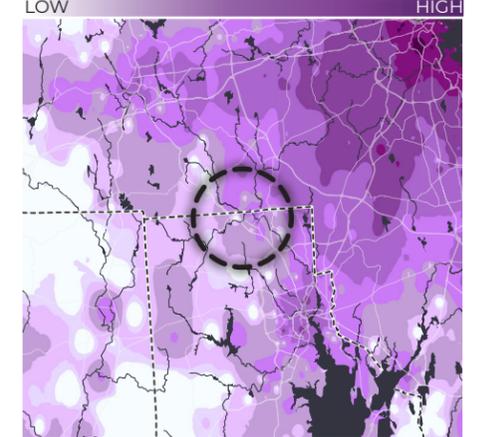


Figure 24

Cycled to Work 2019

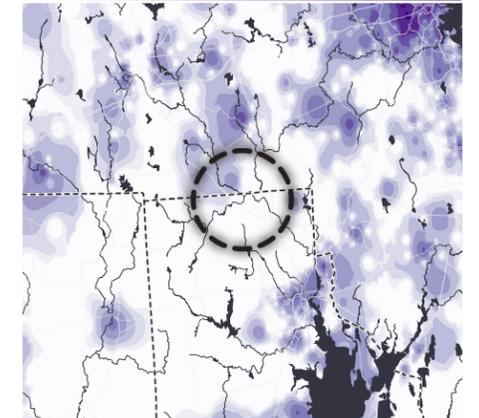


Figure 26

Median Commute Time

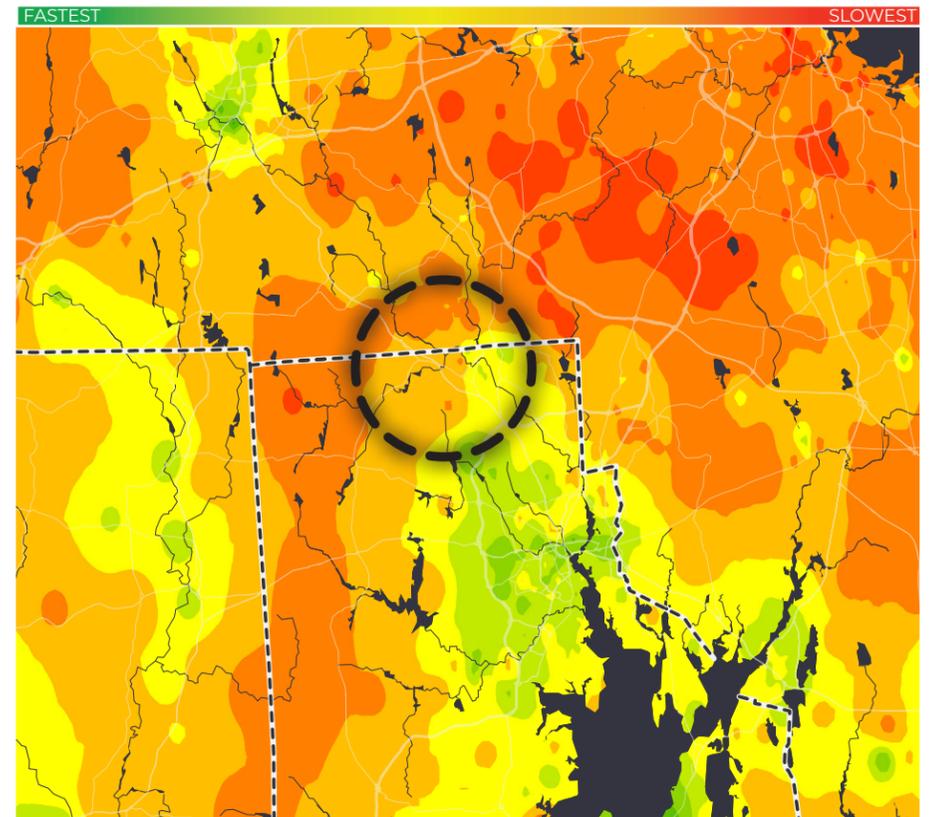


Figure 27

Planning Goals

Equity, Sustainability, & Self-Sufficiency

Through a planning and community engagement strategy that focuses on social equity, environmental sustainability, and long-term self-sufficiency for residents, the goals for the project are met for the reasons outlined below. It is also important to note that 100% of units on-site will be affordable, serving low- and moderate-income individuals and families in the Northern Rhode Island Community.

Development Goals & Residents to be Served

As mentioned in the Executive Summary, the primary goals for this project are to build a community anchor that provides access to home ownership, increases employment opportunities, and connects new and existing residents with nearby Woonsocket, Providence, and Massachusetts, and actively invest in the Branch Village Community through new housing, commercial space, and infrastructure connections. Residents who will be served by this development are low and very-low income individuals and family households with children. As the 2021 Qualified Allocation Plan (QAP) for Rhode Island outlines that these two categories of residents are in the four primary categories that receive priority for Low Income Housing Tax Credit (LIHTC) funding,

the nature of serving these types of residents merges nicely with capital subsidy funding.²⁰ These residents will be served by the development in a number of ways. First, there are a total of 15 units serving residents earning 30% Area Median Income (AMI) and a total of 39 units serving residents earning 50% AMI - both of which can be defined as very-low and moderately-low income. Second, there are a total of 27 two-bedroom and 23 three-bedroom units - both of which effectively serve families with children. Third, there is a large communal area of 5,500+ SF that serves the development's residents in a variety of ways.

Contributions Made to the Community

The provision of 76 new affordable housing units to the community is a significant contribution. There are one-, two-, and three-bedroom units available, and there varying levels of AMI between 30%-80% supported by the project. In addition to the provision of affordable housing, there are also a number of other contributions made by the site in the form of social services. Programming on site will include:

1. job readiness programs,
2. homebuyer and home-ownership education programs,
3. Daycare services,
4. Financial planning programs,
5. Healthcare financial budgeting programs, and
6. 6A resident council program.

Based on an interview with an existing North Smithfield resident, it is understood that there are few (if any) job readiness programs, daycare services, and homeownership education programs. Figure 28 to the right visually illustrates these six different social services for the new development. These services speak to the project's primary goals and are important components of an equitable, sustainable, self-sufficient, and healthy community. These services will be provided in the 5,500+ SF of communal area on site.

"I don't like the space [I live in now]. The first thing I'm looking for is more space and more rooms."

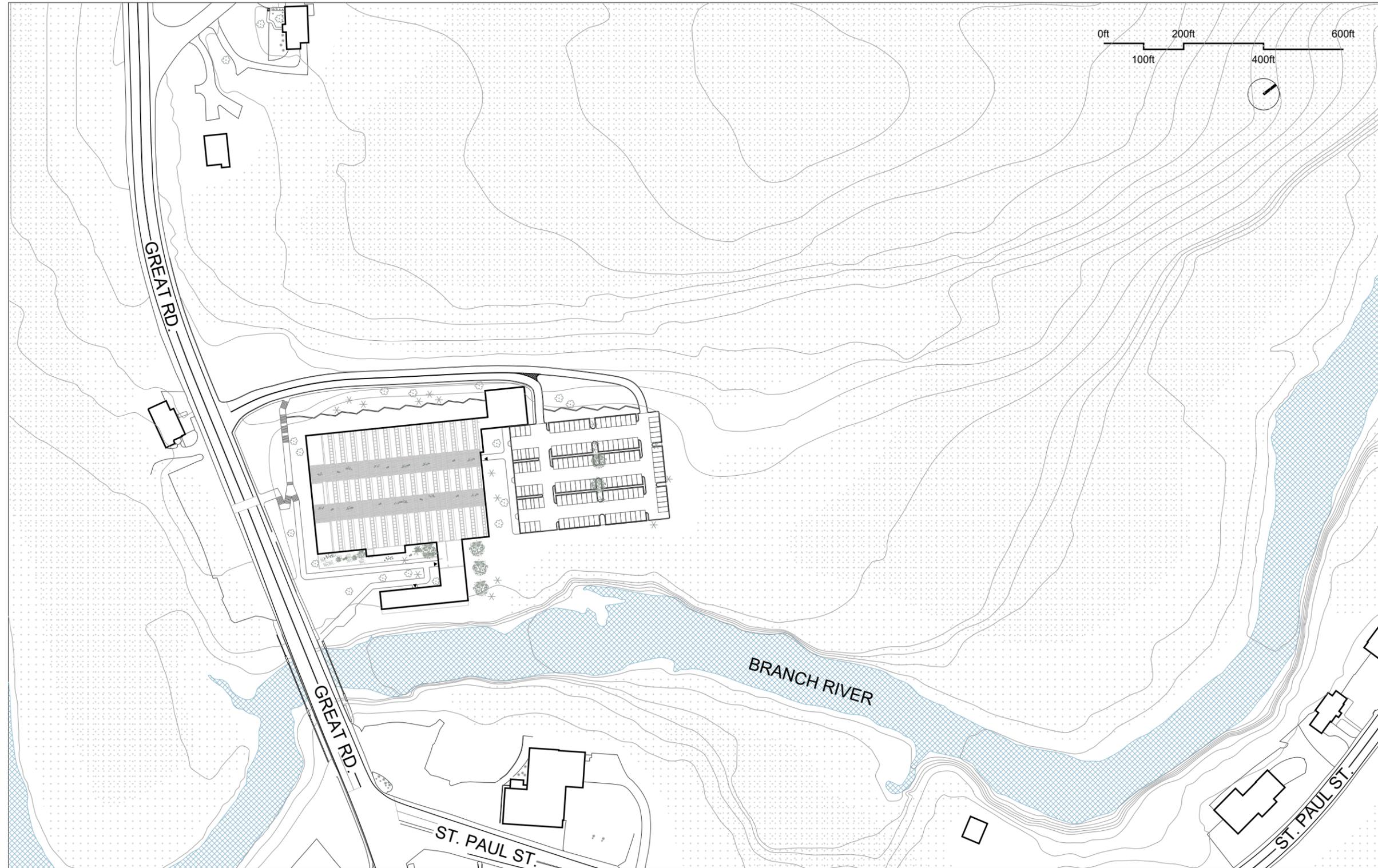
- Yameliz, North Smithfield Community Resident

Social Service Programming



Figure 28

Site Plan



Andrews Mill site includes a vast 33-acre forest abutting the Branch River and Great Road that running over the river, bridging the City of Woonsocket to the historic Branch Village. There is the beautiful Blackstone Gorge natural area to the north of the site.

While the beautiful woods and waterways make the natural character of the site an enjoyable amenity, it presents some difficulties in development resulting from the area's steep slope. The north side of the mill is built as a single-story, whereas the south side facing the Branch River is two-story, leaving half of the building underground. The 100-year floodplain area passes through the west side of the building, due to its proximity to the Branch River.

Yet, this site offers a unique opportunity to provide residents a home close to work outside an urban context, all while providing current Branch Village Residents a place to enjoy the river from shops or community areas.

As the Andrews Mill develops its own new unique form as a community anchor, this site's expansive area provides opportunities for further housing expansion and opens space recreation access around the river and forest on-site for all the neighbors in Branch Village to enjoy.

Figure 29

Adaptive Reuse Principles

Preservation as Priority

Built in 1918, the Main Mill measured 146' by 215', which was an unusually large single sawtooth structure for this typology. After Andrews Mill Company, the next tenant, Tupper Corporation 'modernized' the front façade by sheathing it with metal panels, and by expanding the building to the northside, in the 1960s.²² Since the historic value of this building is on the Main Mill resulting from the sawtooth brick mill structure that enjoyed its heyday during 1890s to 1920s in New England area, our direction was set to remove the additional expansions that came in 1960s, and to restore the original look of the mill as much as possible. Among many elements, preservation of the sawtooth roof became our highest priority.

Since our housing is not built from tabula rasa but by renovating the mill factory, a careful survey of the existing building and the site condition is essential.

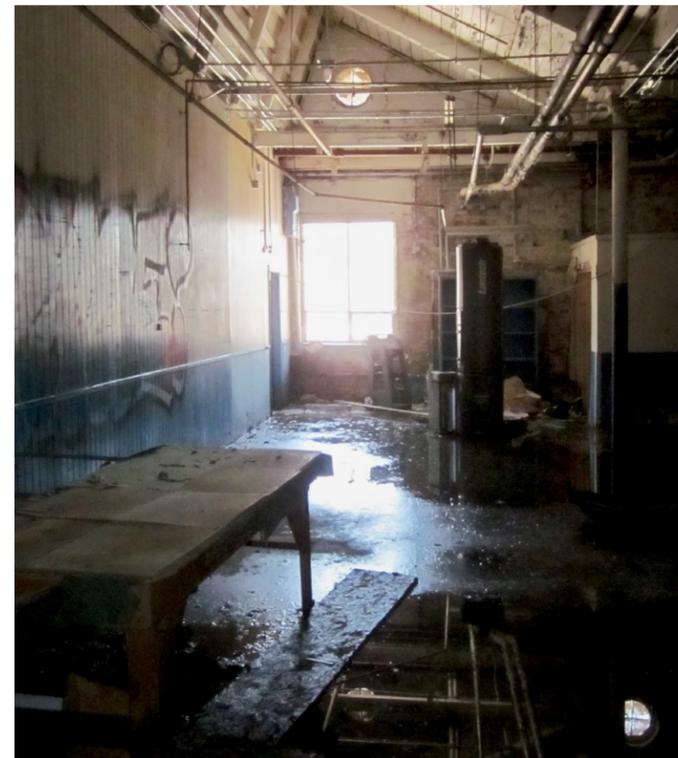


Figure 30

As of March, the building was vacant, shown in Figures 30 and 31.²¹ The brick façade of the original building was painted white on the exterior, and the south, non-sawtooth portion of the building was covered with steel panels. Also, along the rear north and east sides of the building, several additional buildings were built in light balloon wood frame structure for extra storages or loading docks. The rear portion of the land was used as an unpaved parking lot.

Since the acquisition of the site by NWBRV, the site has been remediated entirely. The remaining tasks remediation tasks surround what to keep and what to demolish, in order to make the building ready for the adaptive reuse.

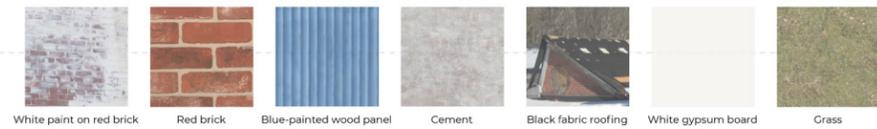
The Main Mill at the Andrews Mill Company Plant is a brick weave shed with a concrete foundation and a sawtooth roof. It was relatively common that such sawtooth roof textile mills to be oriented toward the north, where the diffused, non-glare light permits close inspection of woven material. Given the building's overall small surface area compared to its volume, reviving the northern ambient light, as it is used in Andrews Mill Company, was the clear strategy to convert the building into housing, where providing lighting into each bedroom is essential.



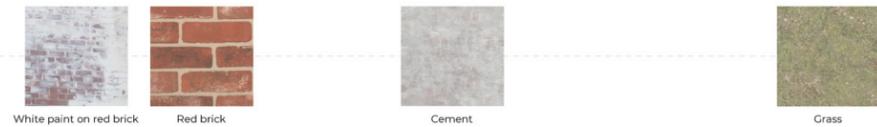
Existing Materials



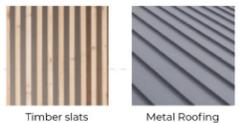
Figure 31



Preserving



Additional



Proposed



Figure 32

Volume Adjustment

Heritage is Future

The greatest challenge for this building is its relatively small surface area compared to the overall building volume. This does not suit the typical residential complex typology.

Residential complexes normally require a flat bar type volume or a long serpentine volume, which satisfy the most important rule of housing: lighting into every bedroom. The given structure of the building could only suit the single-loaded corridor with a maximum of 30 units, and this number caused financial difficulties. In order to make the project financially feasible, more than the double of this unit number was necessary.

Our design proposal resolved the issue by breaking up the building into three bar volumes, and by expanding the currently partial basement into a full floor. By doing so, even though the subtraction of excavation fee and structural reinforcement fee, the project becomes financially feasible by generating greater net operating incomes.

Realization of our proposal incorporates three construction works prior to the renovation of the building. First is to excavate the remaining basement, including the portion of dirt around the building as well to provide lighting on the west side and portion of the east side. However, if this is just excavated, the building is likely to collapse, therefore it calls for a structural reinforcement of the foundation before excavation. Thus, the second step is foundation-shoring by supporting the weight of the ground floor building through two prefabricated concrete columns of 1'x1' both west side and east side of the existing columns. This prefab

concrete column has a steel pile inside that also serves as a foundation below while enhancing the building's structural integrity. The last, but not least, construction work is extending the existing thin round columns down to the level below so that the entire building functions as one. This column grid also serves as a single module for each housing unit. The exterior walls were already built all the way to the basement level, so even if the volume inside were to be unexcavated, the extra construction of the exterior brick wall would be unnecessary in this case.

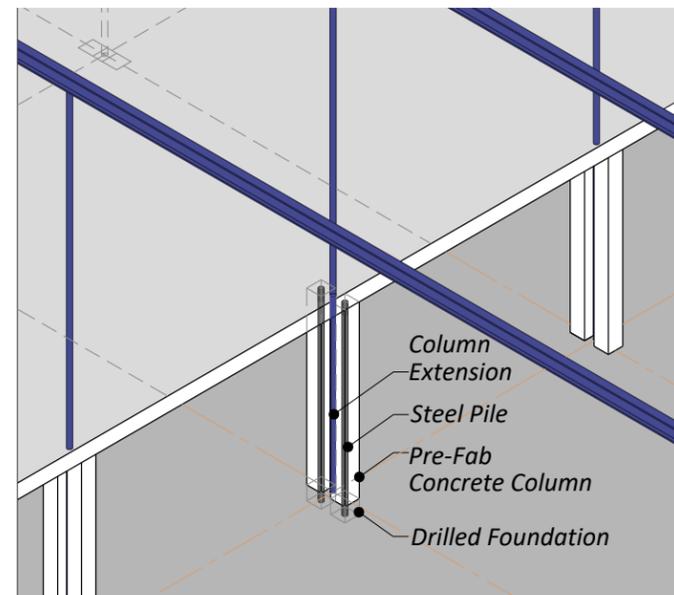


Figure 33

Site Strategies

We Are Family-Oriented

On the current waiting list for this affordable housing, 3-bedroom unit is in highest demand. This reflects potential tenant demographics that a family of 3 or 4, with children, are most likely to inhabit in the building. This calls for a family-oriented program or a daycare program. The west side entrance space connected to the commercial area is entirely provided to this community need, which also works as a buffer zone in between the public and private areas.

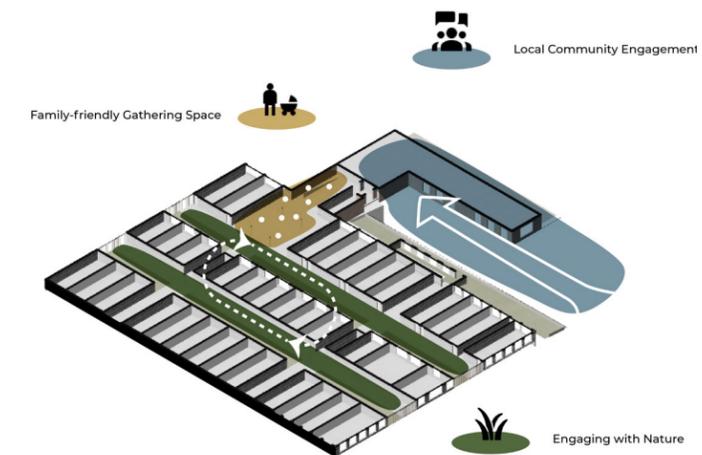


Figure 34

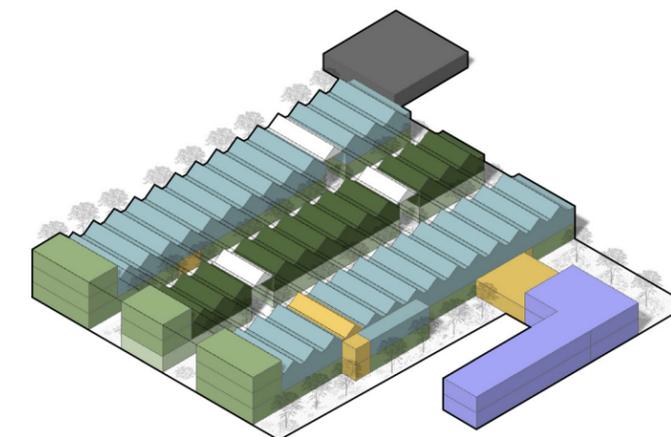


Figure 35

Program zoning throughout the building is done with careful consideration of its neighboring site context. Public areas, such as commercial zone, community engagement area, and 'façade-like' welcoming landscaping, are all placed on the south-east corner of the building where the general public traffic is the heaviest. The space can also host a variety of programs and community events for all residents living on-site.

Meanwhile, personal transportation modes, such as car, bike, or Segway, are separated to the north and west side of the building. The parking lot is entirely divided from the public zone. There is also a bike rack zone on the west side to the building. The intention behind this is to completely separate the pedestrian traffic to the south, from the automobile-oriented traffic to the north. As a result, the slower pace of movement on the south-east façade will allow people to gather by the Branch River side and enjoy nature on the deck, like the eddy current of the stream.

- 1BD
- 2BD
- 3BD
- 3BD Duplex
- Community
- Commercial
- Mechanical

The site provides large amounts of two-, three-, and three-bedroom duplexes, and these units are catered to families in North Smithfield. It is the hope and vision of the project team for families to thrive in the new Andrews Mill.

Plan Layout

The project team converted the single-story mill to a three-story apartment building, offering ample spaces for families and communities. These spaces will feature beautiful landscaping as well as providing commercial space and other uses to support the families who will call Andrews Mill home.

Ground Floor



- 1B. 1 Bedroom
- 2B. 2 Bedroom
- 3B. 3 Bedroom
- 3B-D. 3 Bedroom Duplex
- A. Accessible Unit

- | | | | | |
|--------------------|--------------------|-----------------|-------------------|--------------|
| 1. Lobby | 4. Retail | 7. Seminar Room | 10. Parking | 13. Corridor |
| 2. Gathering Space | 5. River View Deck | 8. Trash | 11. Drop-off Zone | 14. Garden |
| 3. Mail Room | 6. Bike Storage | 9. Mechanical | 12. Laundry Room | |

Figure 36



Figure 37



Figure 38

Second Floor

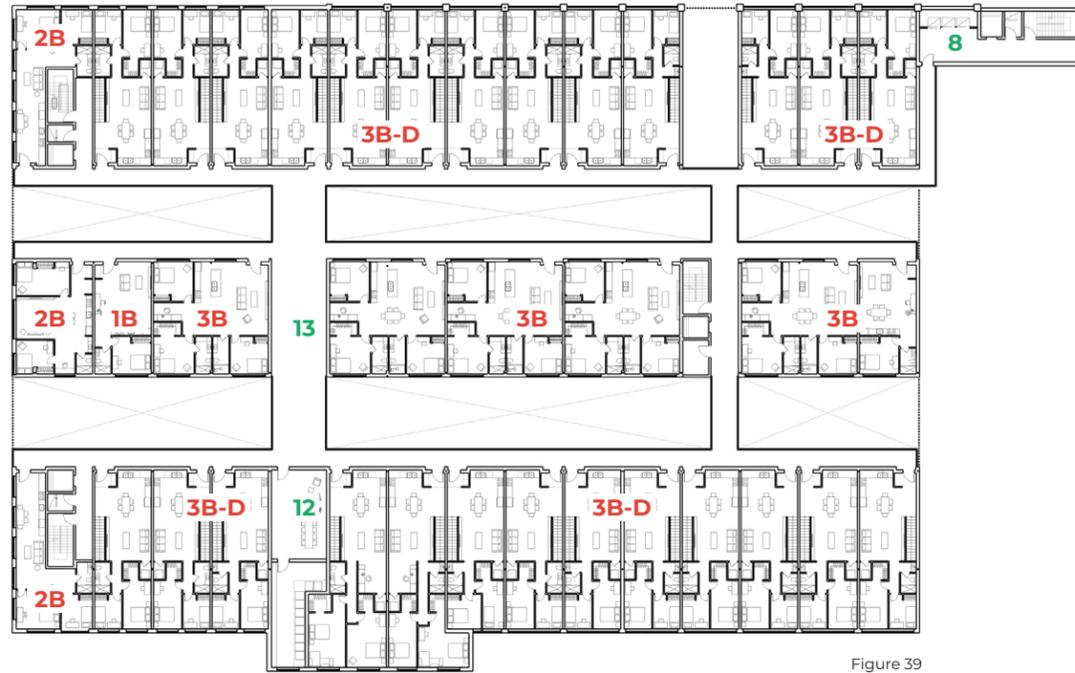


Figure 39

Third Floor

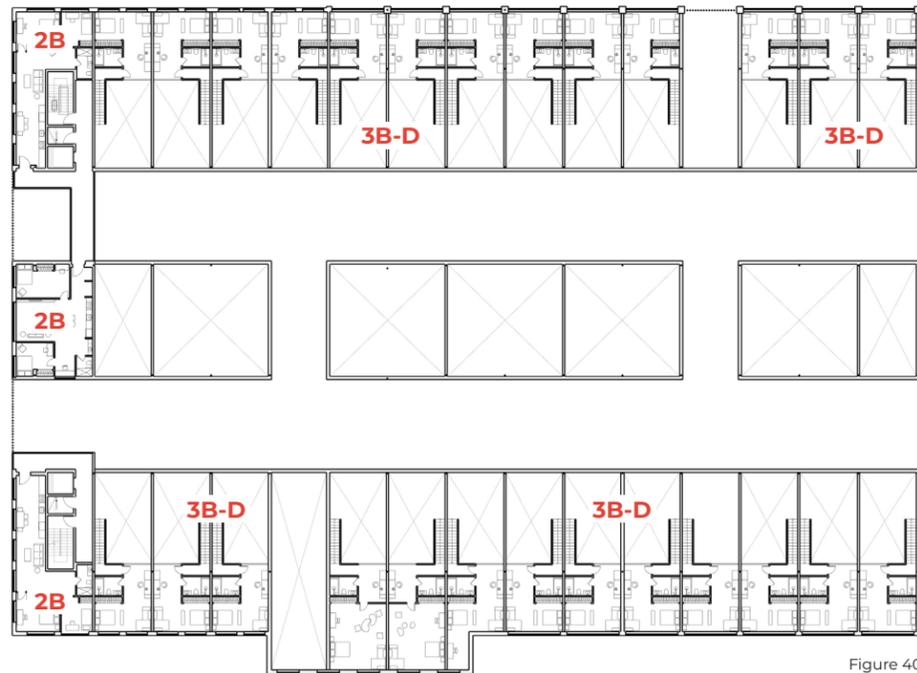
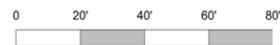


Figure 40

- 1. Lobby
- 2. Gathering Space
- 3. Mail Room
- 4. Retail
- 5. River View Deck
- 6. Bike Storage
- 7. Seminar Room
- 8. Trash
- 9. Mechanical
- 10. Parking
- 11. Drop-off Zone
- 12. Laundry Room
- 13. Corridor
- 14. Garden



Typical Units

One-bedroom
605 sf
14 units

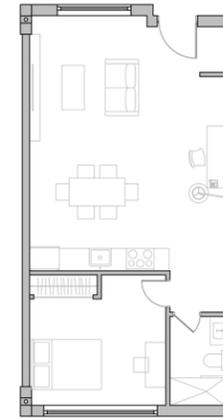
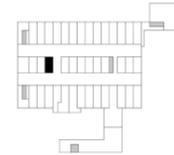


Figure 41

Two-bedroom
860 sf
29 units



Figure 42

Three-bedroom
1,250 sf
9 units

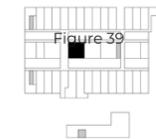


Figure 43

Three-bedroom Duplexes
1,288 sf
24 units

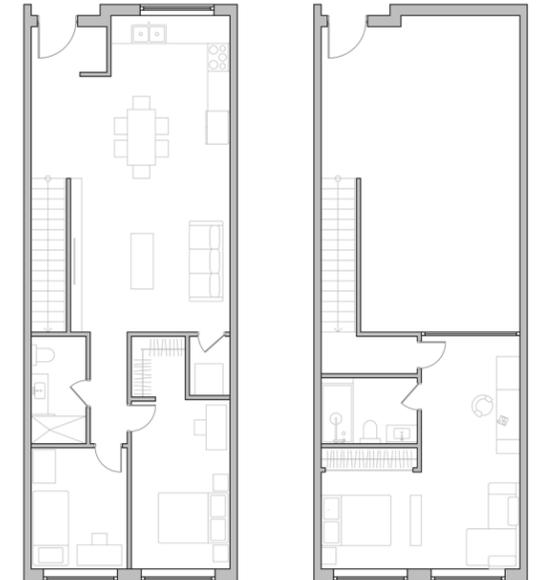


Figure 44

Sustainability

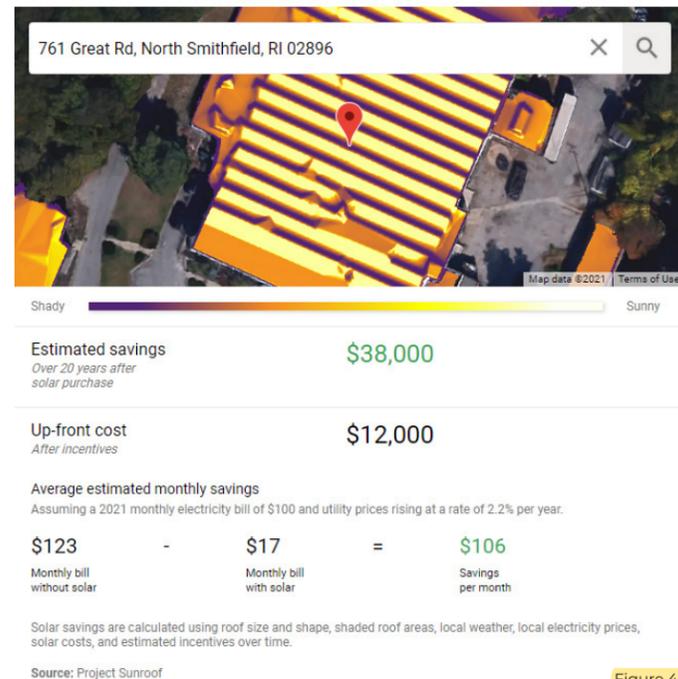
Greenest In Town

Revamping this historic industrial site to a modern, green building is a major priority. The project team implemented significant sustainability measures to set a model in the town of North Smithfield and city of Rhode Island.

The nature of the sawtooth roof being oriented due north allows for many environment-friendly strategies. The larger face of the roof that is facing southward perfectly suits saving energy through solar panel usage. The typical solar panel for residential use is 65 inches by 39 inches, and the 14 sawtooth roof structure allows a total of 1,008 panels to be installed, leading to an estimated \$38,000 reduction in operating expenses over the next 20 years after installation.

²³ Solar savings estimator

Estimate how much you can save on your electric bill with rooftop solar.



The smaller face of the roof facing due north is replaced with a double glazed window. The sealed air gap between the two panes will work as an added layer of insulation, preventing unwanted heat in the summer and retaining heat during the winter. All the while, this will allow ambient, even light throughout the day. Since the natural lighting is plentiful, this will further reduce the operation expenses by lowering the electricity used for the lighting up the room.

Another use of the sawtooth roof is that many gable lines allow for a rainwater water harvesting system for all units. This could reduce the building's dependency on main supply of water.

Furthermore, given that this building is an adaptive reuse, reusing existing bricks, concrete blocks, and steel frames makes the building more waste-free during the construction process than typical new construction projects. New materials used for the building, such as wood screens along the corridor, are selected with based on using the lowest possible carbon footprints.

This project also reuses the additional building on the north-east corner of the building, which was previously added for installing two cooling towers, as a central mechanical room, along with laundry room. The condensing line extends from this mechanical room and connect back into the Main Mill building that has two small 2x2' closets for the fan coil and heat pump. Above all, the central ERV (Energy Recovery Ventilator) will reduce the HVAC bill even further.

Figure 45

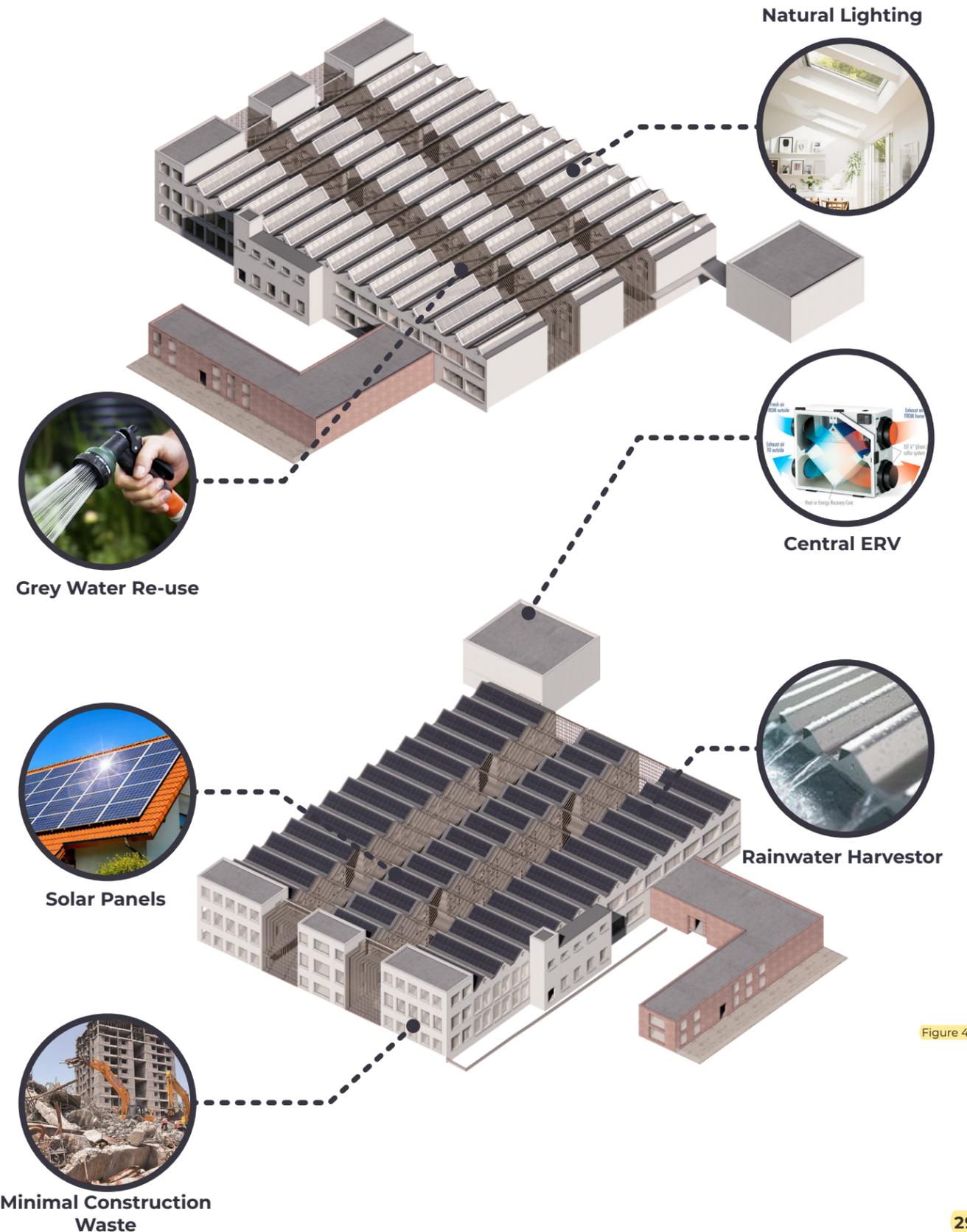


Figure 46

Finance

Overview & Unit Mix

Andrew Mills will provide a diverse and high-quality living environment for residents of various income levels - 76 units of housing consisting of 1 bedroom, 2 bedroom, and 3 bedroom units. All 76 units will be leased at some level of affordability. The project offers a mix of 30%, 50%, 60%, and 80% AMI income-restricted units, which will foster affordability and resident income diversity at the same time.

Andrews Mill Project will be deeply affordable, with 20% of the units being under the 30% AMI rate with vouchers, 60% of units being under the 50% AMI rate, and 92% of the units being under the 60% AMI rate.

The net commercial area was increased from 4405 SQFT to 12043 SQFT to enliven the project with more commercial activities. The total residential unit numbers increased from 29 to 76 as this project developed.

GENERAL DEVELOPMENT INFORMATION

Development Name	Andrews Mill
Project Description	Substantial Rehab of National Register Historic Mill and New Construction
Address	765 Great Road (Plat 05 Lots: 029, 052)
City/Town	North Smithfield, Rhode Island 02896
Census Tract	128
Number of Buildings	1 Existing Building, 1 Connected Commercial/Retail Building
Lot Area (Acres)	35
Lot Area SF	1,524,600
Open Area SF	1,406,351
Building Gross SF	118,249
Residential Building Common Area SF	4,014
Average Unit Gross Area in SF	1,556
Parking Area	43,968
Total Parking Spaces	124
Residential	
Number of Total Units	76
Unit Rentable Area (SF)	
1 Bed	605
2 Bed Type 1	860
3 Bed	1,250
3 bed duplex	1,288
Commercial	
765 Great Road	
Gross SF	12,043
Rent/SF	0.78
Monthly Rev	9,394
Total Annual Rev	112,722

Figure 47

Key facts

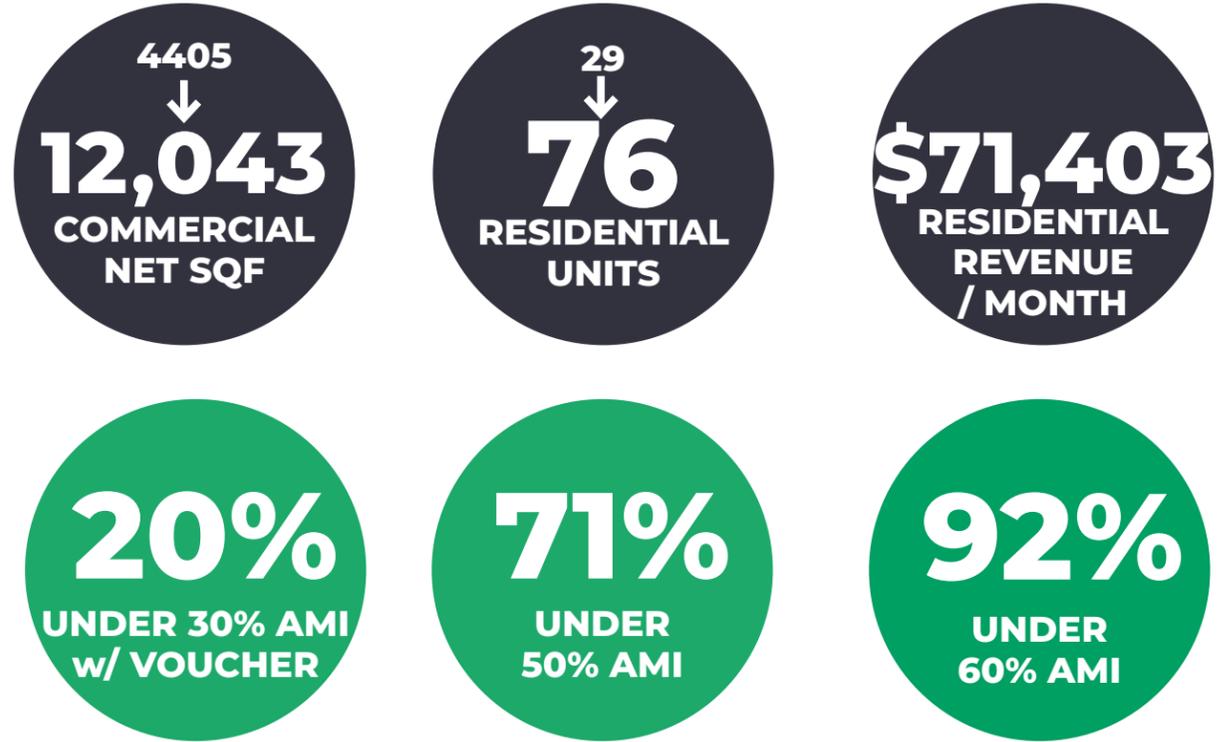


Figure 48

RESIDENTIAL APARTMENTS: RENTS, UTILITY ALLOWANCE & INCOME ELIGIBILITY

Description	Gross SF	# Units	Maximum LIHTC Rent	Utility Allowance	Net Rent	Total Monthly Revenue	Total Annual Revenue	Household Size	Household Income Eligibility Range	Rent as % of AMI
One Bedroom 30% AMI	1,815	3	489	118	693	\$ 2,080	\$ 24,957	1.5	19,575	30%
One Bedroom 50% AMI	4,235	7	811	118	693	\$ 4,853	\$ 58,233	1.5	32,450	30%
One Bedroom 60% AMI	1,210	2	979	118	861	\$ 1,722	\$ 20,658	1.5	39,150	30%
One Bedroom 80% AMI	1,210	2	1,298	118	1,180	\$ 2,360	\$ 28,323	1.5	51,925	30%
Two Bedroom 30% AMI	4,300	5	587	154	820	\$ 4,100	\$ 49,200	3	23,490	30%
Two Bedroom 50% AMI	36,190	16	974	154	820	\$ 13,116	\$ 157,392	3	38,950	30%
Two Bedroom 60% AMI	30,912	6	1,175	154	1,021	\$ 6,123	\$ 73,476	3	46,980	30%
Two Bedroom 80% AMI	2,576	2	1,558	154	1,404	\$ 2,807	\$ 33,684	3	62,300	30%
Three Bedroom 30% AMI	8,750	7	684	187	938	\$ 6,566	\$ 78,792	4.5	27,350	30%
Three Bedroom 50% AMI	20,000	16	1,125	187	938	\$ 15,008	\$ 180,096	4.5	45,000	30%
Three Bedroom 60% AMI	10,304	8	1,368	187	1,181	\$ 9,444	\$ 113,328	4.5	54,700	30%
Three Bedroom 80% AMI	2,576	2	1,799	187	1,612	\$ 3,225	\$ 38,697	4.5	71,975	30%
Total	122,263	76				\$ 71,403	\$ 856,836			

Figure 49

Sources and Uses

A unique mix of diverse sources celebrating the project's history, character, sustainability, deep affordability, and revitalization.

Key facts



Equity

Andrews Mill will take full advantage of the 9% LIHTC program.²⁴ Additionally, with the recognition of Andrews Mill's historical significance, the project team leveraged the Federal Historic Tax Credit to supplement the equity.²⁵ Lastly, the site's sustainable features also enabled the project team to incorporate a Solar Tax Credit.²⁶

Hard debt

The project team estimates the permanent debt capacity to be 2.3 million by FHLBB AHP's 1st mortgage loan.²⁷ The lower Debt Service Coverage ratio is based on the underwriting standards and uses a 30-year amortization, 20-year term, and 3.75% interest rate according to their evaluation of this project. This only consists of 8% of the total cost.

Soft debt

Like any tax-credit project, Andrews Mill takes a unique mix of soft debt offerings available. The incorporation of the Workforce Housing Initiative, Capital Magnet Fund, and the Housing Trust Fund reflects the project team's commitment to deep and longstanding affordability and poverty reduction. Lastly, the project team believes that the comprehensive revitalization effort will allow the site to have a competitive advantage on the CDBG and Urban Revitalization Grant Fund. The sustainable effort to rehabilitate the site will also leverage the EPA Brownfields Remediation Grant.²⁸

Figure 50

SOURCES OF FUNDS, TERMS & DESCRIPTIONS				Amount	Per Unit	% of Sources	Note
Equity							
Federal LIHTC (9%)				\$ 12,492,351	\$ 164,373	46%	Equity
Federal Historic Tax Credit				\$ 1,602,718	\$ 21,088	6%	Equity
Solar Tax Credit				\$ 198,740	\$ 2,615	1%	Sponsor Loan
Hard Debt							
	Amort	Term	Interest				
AHP 1st Loan	360	240	3.75%	\$ 2,289,171	\$ 30,121	8%	First Mortgage
Soft Debt							
AHP Direct Subsidy				\$ 650,000	\$ 8,553	2%	Sponsor Loan
Housing Trust Fund (HTF)				\$ 2,000,000	\$ 26,316	7%	Sponsor Loan
Federal Capital Magnet Fund (CMF)				\$ 2,000,000	\$ 26,316	7%	Sponsor Loan
Federal Housing HOME				\$ 1,800,000	\$ 23,684	7%	Sponsor Loan
US Environmental Protection Agency (EPA) Brownfields Remediation Grant				\$ 1,600,000	\$ 21,053	6%	Sponsor Loan
State of RI HRC BHRI Bond				\$ 1,120,000	\$ 14,737	4%	Sponsor Loan
Workforce				\$ 480,000	\$ 80,000	2%	Sponsor Loan
Urban Revitalization Grant Funds				\$ 501,841	\$ 6,603	2%	Sponsor Loan
CDBG				\$ 406,323	\$ 5,346	1%	Sponsor Loan
Total Sources of Funds				\$ 27,141,143	\$ 357,120	100%	
Uses of Funds				\$ 27,141,143			
Surplus (GAP)				\$ 0			

Figure 51

Development Budget

Financial feasibility through maximizing units and lowering development costs per unit in historic rehabilitation.

Key facts

\$27.1
Million in Total Development Cost

\$328,667
<\$375k (cap)
Development Cost per Unit

81%
Construction Cost

Andrews Mill has a relatively low development cost per unit as compared to other historic mill rehabilitation projects. This lower cost is made possible by increasing the number of units in the main building. The original plan drawn by NWBRV's architect only incorporated less than 30 units to ensure lighting. While preserving and even exceeding the lighting standard with an innovative indoor street design, the project team successfully doubled the units to 76 to reduce the per unit cost of development.

TAX CREDIT CALCULATIONS

FEDERAL LIHTC (9%)

Total Number of Units in Project	76
Number of LIHTC Units in Project	70
Total Development Costs (Incl. Acq.)	\$ 27,141,143
(Total Acquisition Costs)	\$ (1,200,000)
(Ineligible Costs)	\$ (2,475,765)
(Historic Tax Credit)	\$ (1,885,550)
Effective Total Eligible Basis	\$ 21,579,827
Applicable Fraction	92%
Total Qualified Basis	\$ 19,876,156
Tax Credit Percentage	9%
Annual Total Tax Credit	\$ 1,788,854
Annual Total Tax Credit Cap	\$ 1,288,000
Annual Awarded Tax Credit	\$ 1,288,000
Years Tax Credit Received	10
Total Tax Credits (Over 10-Year Period)	\$ 12,880,000
Ownership Percentage for Tax Credit Investor	99.99%
Total Amount of Tax Credits Received by Tax Credit Investor over 10-Year Per \$	12,878,712
Tax Credit Investor Equity Contribution Per \$ of Total Tax Credits	0.97
Estimated Total Equity Contribution by LIHTC Investor	\$ 12,492,351
Estimated Total Equity Contribution by LIHTC Investor Per LIHTC Unit	\$ 178,462
Average Total Development Cost/Unit	\$ 328,667
Per Unit LIHTC Equity Investment as a % of Total Development Cost	54.30%

Federal Historic Tax Credits

Qualified Basis	\$ 9,427,751
Tax Credit Percentage	20%
Maximum Annual Tax Credit	\$ 1,885,550
Allocation Adjustment	0.85
Actual Allocation	\$ 1,602,718

Figure 53

DEVELOPMENT COST

	Total	Cost per Gross			Cost per Gross		
		Residential Cost	Square Foot (GSF)	Cost per Unit	Commercial Cost	Square Foot (GSF)	Cost per Unit
Acquisition: Land	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Acquisition: Building	\$ 1,200,000	\$ 1,200,000	\$ 10.15	\$ 15,789	\$ -	\$ -	\$ -
Acquisition Subtotal	\$ 1,200,000	\$ 1,200,000	\$ 10.15	\$ 15,789	\$ -	\$ -	\$ -
Direct Construction Budget	\$ 20,842,280	\$ 18,992,107	\$ 160.61	\$ 249,896	\$ 1,850,173	\$ 153.63	\$ 153.63
Construction Contingency 5.0%	\$ 1,042,114	\$ 949,605	\$ 8.03	\$ 12,495	\$ 92,509	\$ 7.68	\$ 7.68
Subtotal: Construction	\$ 21,884,394	\$ 19,941,712	\$ 168.64	\$ 262,391	\$ 1,942,682	\$ 161	\$ 161
General Development Costs	Total						
Architecture & Engineering 6.50%	\$ 1,417,601	\$ 1,288,728	\$ 10.90	\$ 16,957	\$ 128,873	\$ 10.70	\$ 10.70
Survey and Permits	\$ 2,099	\$ 1,908	\$ 0.02	\$ 25	\$ 191	\$ 0.02	\$ 0.02
Clerk of the Works 1%	\$ 218,092	\$ 198,266	\$ 1.68	\$ 2,609	\$ 19,827	\$ 1.65	\$ 1.65
Environmental Engineer	\$ 55,000	\$ 50,000	\$ 0.42	\$ 658	\$ 5,000	\$ 0.42	\$ 0.42
Legal	\$ 390,500	\$ 355,000	\$ 3.00	\$ 4,671	\$ 35,500	\$ 2.95	\$ 2.95
Title and Recording	\$ 128,700	\$ 117,000	\$ 0.99	\$ 1,539	\$ 11,700	\$ 0.97	\$ 0.97
Accounting & Cost Cert.	\$ 8,250	\$ 7,500	\$ 0.06	\$ 99	\$ 750	\$ 0.06	\$ 0.06
Marketing and Rent Up	\$ 8,250	\$ 7,500	\$ 0.06	\$ 99	\$ 750	\$ 0.06	\$ 0.06
Real Estate Taxes	\$ 15,444	\$ 14,040	\$ 0.12	\$ 185	\$ 1,404	\$ 0.12	\$ 0.12
Insurance	\$ 165,000	\$ 150,000	\$ 1.27	\$ 1,974	\$ 15,000	\$ 1.25	\$ 1.25
Appraisal	\$ 8,250	\$ 7,500	\$ 0.06	\$ 99	\$ 750	\$ 0.06	\$ 0.06
Construction Loan Interest 4.75%	\$ 41,563	\$ 41,563	\$ 0.35	\$ 547	\$ -	\$ -	\$ -
Other Financing Fees 1%	\$ 11,083	\$ 11,083	\$ 0.09	\$ 146	\$ -	\$ -	\$ -
Soft Cost Contingency 2%	\$ 81,216	\$ 81,216	\$ 0.69	\$ 1,069	\$ -	\$ -	\$ -
Subtotal: Gen. Dev.	\$ 2,551,048	\$ 2,331,304	\$ 19.72	\$ 30,675	\$ 219,744	\$ 18	\$ 18
Subtotal: Acquis., Const., and Gen. D	\$ 25,635,443	\$ 23,473,016	\$ 198.50	\$ 308,855	\$ 2,162,426	\$ 180	\$ 180
Capitalized Reserves	\$ 512,000	\$ 512,000	\$ 4.33	\$ 6,737	\$ -	\$ -	\$ -
Developer Fee	\$ 1,505,700	\$ 1,505,700	\$ 12.73	\$ 19,812	\$ -	\$ -	\$ -
Total Development Cost	\$ 27,653,143	\$ 25,490,716	\$ 215.57	\$ 335,404	\$ 2,382,170	\$ 197.81	\$ 197.81
TDC, Net	\$ 27,141,143	\$ 24,978,716	\$ 211.24	\$ 328,667	\$ 2,382,170	\$ 197.81	\$ 197.81

Figure 54

RESIDENTIAL DIRECT CONSTRUCTION BUDGET

Trade Item	Amount	Cost per SF
Concrete	\$ 1,374,053	\$ 1.94
Masonry	\$ 1,757,180	\$ 19.48
Metals	\$ 1,201,410	\$ 12.13
Rough Carpentry	\$ 1,255,804	\$ 10.62
Insulation	\$ 337,010	\$ 2.85
Sheet Metal and Flashing	\$ 37,840	\$ 0.32
Doors	\$ 36,657	\$ 0.31
Windows	\$ 1,461,558	\$ 12.36
Roof Windows & Skylights	\$ 515,566	\$ 4.36
Lath & Plaster	\$ 871,495	\$ 7.37
Tile Work	\$ 118,249	\$ 1.00
Acoustical	\$ 135,986	\$ 1.15
Wood Flooring	\$ 114,702	\$ 0.97
Resilient Flooring	\$ 101,694	\$ 0.86
Carpet	\$ 76,862	\$ 0.65
Paint & Decorating	\$ 425,696	\$ 3.60
Specialties	\$ 192,746	\$ 1.63
Equipment	\$ 205,753	\$ 1.74
Cabinets	\$ 449,346	\$ 3.80
Plumbing	\$ 960,182	\$ 8.12
HVAC	\$ 2,037,430	\$ 17.23
Fire Protection	\$ 273,155	\$ 2.31
Electrical	\$ 1,850,597	\$ 15.65
Electronic Safety & Security	\$ 118,249	\$ 1.00
Solar Panel	\$ 201,600	\$ 1.70
Subtotal Structural	\$ 16,110,820	\$ 136.24

Earth Work	\$ 523,843	\$ 4.43
Site Utilities	\$ 354,747	\$ 3.00
Roads & Walks	\$ 331,097	\$ 2.80
Site Improvement	\$ 283,798	\$ 2.40
Lawns & Planting	\$ 80,409	\$ 0.68
Demolition	\$ 64,918	\$ 0.55
Subtotal Site Work	\$ 1,638,812	\$ 13.86

Total Improvements \$17,749,633 \$ 150.10

Builders Overhead	\$ 354,993	\$ 3.00
Builders Profit	\$ 887,482	\$ 7.51

TOTAL \$18,992,107 \$ 160.61

Figure 55

COMMERCIAL DIRECT CONSTRUCTION BUDGET

Trade Item	Amount	Cost per SF
Concrete	\$ 15,174	\$ 1.26
Masonry	\$ 168,482	\$ 13.99
Metals	\$ 71,897	\$ 5.97
Framing	\$ 60,215	\$ 5.00
Insulation	\$ 12,043	\$ 1.00
Doors	\$ 69,127	\$ 5.74
Windows	\$ 50,340	\$ 4.18
Lath & Plaster	\$ 88,757	\$ 7.37
Tile Work	\$ 34,443	\$ 2.86
Acoustical	\$ 44,920	\$ 3.73
Wood Flooring	\$ 16,860	\$ 1.40
Resilient Flooring	\$ 18,787	\$ 1.56
Carpet	\$ 4,817	\$ 0.40
Specialties	\$ 10,718	\$ 0.89
Furnishings	\$ 89,841	\$ 7.46
Plumbing	\$ 103,329	\$ 8.58
HVAC	\$ 207,501	\$ 17.23
Fire Protection	\$ 65,634	\$ 5.45
Electrical Communications	\$ 93,213	\$ 7.74
Electrical	\$ 157,282	\$ 13.06
Electronic Safety & Security	\$ 28,783	\$ 2.39
Subtotal Structural	\$ 1,412,162	

Earth Work	\$ 62,021	\$ 5.15
Site Utilities	\$ 137,049	\$ 11.38
Site Improvement	\$ 103,088	\$ 8.56
Lawns & Planting	\$ 8,189	\$ 0.68
Demolition	\$ 6,624	\$ 0.55
Subtotal Site Work	\$ 316,972	\$ 2.68

Total Improvements \$1,729,134 \$ 14.62

Builders Overhead	\$ 34,583	\$ 0.29
Builders Profit	\$ 86,457	\$ 0.73

TOTAL \$1,850,173 \$ 153.63

Figure 56

Figure 52

Operating Budget

Strong commercial income through creative rehabilitation to enable deep affordability

Key facts

\$0.8
 <\$1.25 market
 commercial
 rent/sqft

5%
 Vacancy Rate
 >3%

\$12k
 Resident
 Service

Figure 57

Commercial Expansion

With the expanded auxiliary building along Branch River as new commercial space, rental revenue, even at a conservative rent of \$0.80, the project team can achieve 92% of total units under 60% AMI and 71% under 50% AMI. This drastic increase in affordable housing stock could greatly help the community reach 10% of affordable housing's regional goal.²⁹ Furthermore the eventual development of new active transportation amenities near the site is in line with the vision of Smart Growth Rhode Island.³⁰

Conservative Vacancy Rate

Even though market vacancy rate is 5%, the project team's investigation of the nearby affordable housing projects shows that the vacancy rate is 2-3% lower than market rate vacancy.³¹ With the high demand for affordable housing, the project team can expect that a higher actual operating income.

Sustainable Program

The project team budgeted more generously for resident services at \$12,000 with a half-time coordinator to lead the project's community programs, including homebuyer education, financial planning, and a resident council. Environmentally sustainable features such as solar panels and passive cooling were included in the design. It is estimated that with the solar panel alone, it will be possible to reduce the annual electricity cost of the common area. Lastly, the comprehensive revitalization effort will allow for a competitive advantage on the CDBG, Urban Revitalization Grant Fund, and the EPA Brown-fields Remediation Grant.³²

OPERATING EXPENSE BUDGET YEAR 1

	Total	Residential	Per Unit Monthly (PUM)	Per Unit Per Year (PUPY)	Commercial	Per SF (Annually)
Management Fee 5.50%	\$ 44,074	\$ 40,000	\$ 44	\$ 526	\$ 4,074	\$ 0.34
Payroll, Administrative	\$ 60,000	\$ 60,000	\$ 66	\$ 789		
Payroll Taxes & Benefits, Admin.	\$ 10,000	\$ 10,000	\$ 11	\$ 132		
Legal	\$ 3,000	\$ 3,000	\$ 3	\$ 39		
Audit	\$ 14,000	\$ 14,000	\$ 15	\$ 184		
Marketing	\$ 700	\$ 700	\$ 1	\$ 9		
Telephone	\$ 4,400	\$ 4,400	\$ 5	\$ 58		
Office Supplies	\$ 7,500	\$ 7,500	\$ 8	\$ 99		
Accounting & Data Processing	\$ 3,500	\$ 3,500	\$ 4	\$ 46		
DHCD Monitoring Fee	\$ 2,000	\$ 2,000	\$ 2	\$ 26		
meeting and training	\$ 1,500	\$ 1,500	\$ 2	\$ 20		
Xerox/printing	\$ 1,500	\$ 1,500	\$ 2	\$ 20		
Other Renting Expenses	\$ 3,600	\$ 3,600	\$ 4	\$ 47		
Miscellaneous Admin.	\$ 4,000	\$ 4,000	\$ 4	\$ 53		
Subtotal: Administrative	\$ 171,557	\$ 155,700	\$ 171	\$ 2,049	\$ 15,857	\$ 1.32
Payroll, Maintenance	\$ 53,000	\$ 53,000	\$ 58	\$ 697		
Payroll Taxes & Benefits, Admin.	\$ 8,000	\$ 8,000	\$ 9	\$ 105		
Janitorial Materials	\$ 1,200	\$ 1,200	\$ 1	\$ 16		
Landscaping	\$ 8,500	\$ 8,500	\$ 9	\$ 112		
Decorating (inter. only)	\$ 8,900	\$ 8,900	\$ 10	\$ 117		
Repairs (inter. & ext.)	\$ 20,000	\$ 20,000	\$ 22	\$ 263		
Trash Removal	\$ 15,000	\$ 15,000	\$ 16	\$ 197		
Snow Removal	\$ 30,000	\$ 30,000	\$ 33	\$ 395		
Extermination	\$ 2,500	\$ 2,500	\$ 3	\$ 33		
Vehicle/Mileage	\$ 3,500	\$ 3,500	\$ 4	\$ 46		
HVAC Contract	\$ 5,000	\$ 5,000	\$ 5	\$ 66		
Fire/Sprinkler Contract	\$ 8,000	\$ 8,000	\$ 9	\$ 105		
Eviction Prevention	\$ 5,000	\$ 5,000	\$ 5	\$ 66		
Subtotal: Maintenance	\$ 182,909	\$ 168,600	\$ 185	\$ 2,218	\$ 14,309	\$ 1.19
Resident Services	\$ 12,000	\$ 12,000	\$ 13	\$ 158		
Electricity	\$ 45,000	\$ 45,000	\$ 49	\$ 592		
Natural Gas	\$ 7,216	\$ 5,000	\$ 5	\$ 66	\$ 2,216	\$ 0.18
Sewer	\$ 30,000	\$ 30,000	\$ 33	\$ 395		
Water	\$ 47,400	\$ 45,000	\$ 49	\$ 592	\$ 2,400	\$ 0.20
Subtotal: Utilities	\$ 129,616	\$ 125,000	\$ 137	\$ 1,645	\$ 4,616	\$ 0.38
Replacement Reserve	\$ 41,870	\$ 38,000	\$ 42	\$ 500	\$ 3,870	\$ 0.32
Real Estate Taxes 8.0%	\$ 77,565	\$ 68,547	\$ 75	\$ 902	\$ 9,018	
Payroll Taxes 18.0%	\$ 11,088	\$ 11,088	\$ 12	\$ 146		
Property & Liability Insurance	\$ 71,500	\$ 65,000	\$ 71	\$ 855	\$ 6,500	
Bonding	\$ 2,000	\$ 2,000	\$ 2	\$ 26		
Workers Comp.	\$ 3,500	\$ 3,500	\$ 4	\$ 46		
Subtotal: Insurance	\$ 88,088	\$ 81,588	\$ 89	\$ 1,074	\$ 6,500	
Subtotal:Taxes, Insurance	\$ 165,653	\$ 150,135	\$ 165	\$ 1,975	\$ 15,518	\$ 1.29
TOTAL EXPENSES	\$ 703,605	\$ 649,435	\$ 712	\$ 8,545	\$ 54,170	\$ 4.50

Figure 58

Cash Flow Projection

One Bedroom 30% AMI	1,815	3
One Bedroom 50% AMI	4,235	7
One Bedroom 60% AMI	1,210	2
One Bedroom 80% AMI	1,210	2
Two Bedroom 30% AMI	4,300	5
Two Bedroom 50% AMI	36,190	16
Two Bedroom 60% AMI	30,912	6
Two Bedroom 80% AMI	2,576	2
Three Bedroom 30% AMI	8,750	7
Three Bedroom 50% AMI	20,000	16
Three Bedroom 60% AMI	10,304	8
Three Bedroom 80% AMI	2,576	2
Total	122,263	76

50% Low Income Housing % 71.05%

YEAR 1 - 15 OPERATING PRO FORMA

	Increase	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Income 2%																
Residential income		\$ 856,836	\$ 873,973	\$ 891,452	\$ 909,281	\$ 927,467	\$ 946,016	\$ 964,937	\$ 984,235	\$ 1,003,920	\$ 1,023,998	\$ 1,044,478	\$ 1,065,368	\$ 1,086,675	\$ 1,108,409	\$ 1,130,577
Commercial gross income		\$ 112,722	\$ 114,977	\$ 117,276	\$ 119,622	\$ 122,014	\$ 124,455	\$ 126,944	\$ 129,483	\$ 132,072	\$ 134,714	\$ 137,408	\$ 140,156	\$ 142,959	\$ 145,819	\$ 148,735
Gross Potential Income		\$ 969,558	\$ 988,950	\$ 1,008,729	\$ 1,028,903	\$ 1,049,481	\$ 1,070,471	\$ 1,091,880	\$ 1,113,718	\$ 1,135,992	\$ 1,158,712	\$ 1,181,886	\$ 1,205,524	\$ 1,229,635	\$ 1,254,227	\$ 1,279,312
Vacancy	5%	\$ 48,478	\$ 49,447	\$ 50,436	\$ 51,445	\$ 52,474	\$ 53,524	\$ 54,594	\$ 55,686	\$ 56,800	\$ 57,936	\$ 59,094	\$ 60,276	\$ 61,482	\$ 62,711	\$ 63,966
Bad Debt	2%	\$ 19,391	\$ 19,779	\$ 20,175	\$ 20,578	\$ 20,990	\$ 21,409	\$ 21,838	\$ 22,274	\$ 22,720	\$ 23,174	\$ 23,638	\$ 24,110	\$ 24,593	\$ 25,085	\$ 25,586
Effective Gross Income		\$ 901,689	\$ 919,723	\$ 938,118	\$ 956,880	\$ 976,018	\$ 995,538	\$ 1,015,449	\$ 1,035,758	\$ 1,056,473	\$ 1,077,602	\$ 1,099,154	\$ 1,121,137	\$ 1,143,560	\$ 1,166,431	\$ 1,189,760
Expenses 3%																
Administrative		\$ 171,557	\$ 176,704	\$ 182,005	\$ 187,465	\$ 193,089	\$ 198,882	\$ 204,848	\$ 210,994	\$ 217,323	\$ 223,843	\$ 230,558	\$ 237,475	\$ 244,600	\$ 251,937	\$ 259,496
Maintenance		\$ 182,909	\$ 188,396	\$ 194,048	\$ 199,870	\$ 205,866	\$ 212,042	\$ 218,403	\$ 224,955	\$ 231,704	\$ 238,655	\$ 245,815	\$ 253,189	\$ 260,785	\$ 268,608	\$ 276,666
Resident Services		\$ 12,000	\$ 12,360	\$ 12,731	\$ 13,113	\$ 13,506	\$ 13,911	\$ 14,329	\$ 14,758	\$ 15,201	\$ 15,657	\$ 16,127	\$ 16,611	\$ 17,109	\$ 17,622	\$ 18,151
Utilities		\$ 129,616	\$ 133,504	\$ 137,510	\$ 141,635	\$ 145,884	\$ 150,260	\$ 154,768	\$ 159,411	\$ 164,194	\$ 169,119	\$ 174,193	\$ 179,419	\$ 184,801	\$ 190,345	\$ 196,056
Replacement Reserves	2%	\$ 41,870	\$ 42,707	\$ 43,562	\$ 44,433	\$ 45,322	\$ 46,228	\$ 47,153	\$ 48,096	\$ 49,057	\$ 50,039	\$ 51,039	\$ 52,060	\$ 53,101	\$ 54,163	\$ 55,247
Insurance		\$ 88,088	\$ 90,731	\$ 93,453	\$ 96,256	\$ 99,144	\$ 102,118	\$ 105,182	\$ 108,337	\$ 111,587	\$ 114,935	\$ 118,383	\$ 121,934	\$ 125,592	\$ 129,360	\$ 133,241
Taxes	8%	\$ 77,565	\$ 79,116	\$ 80,698	\$ 82,312	\$ 83,959	\$ 85,638	\$ 87,350	\$ 89,097	\$ 90,879	\$ 92,697	\$ 94,551	\$ 96,442	\$ 98,371	\$ 100,338	\$ 102,345
Total Operating Expenses		\$ 703,605	\$ 723,519	\$ 744,006	\$ 765,084	\$ 786,769	\$ 809,079	\$ 832,033	\$ 855,649	\$ 879,946	\$ 904,945	\$ 930,666	\$ 957,130	\$ 984,359	\$ 1,012,375	\$ 1,041,202
Net Operating Income		\$ 198,084	\$ 196,204	\$ 194,111	\$ 191,796	\$ 189,249	\$ 186,459	\$ 183,416	\$ 180,109	\$ 176,526	\$ 172,657	\$ 168,488	\$ 164,007	\$ 159,201	\$ 154,056	\$ 148,558
Annual Must-Pay Debt Service		\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218	\$ 127,218
Initial Cash Flow		\$ 70,866	\$ 68,986	\$ 66,893	\$ 64,578	\$ 62,031	\$ 59,241	\$ 56,198	\$ 52,891	\$ 49,308	\$ 45,439	\$ 41,270	\$ 36,789	\$ 31,983	\$ 26,838	\$ 21,340
Must-Pay DSCR		1.56	1.54	1.53	1.51	1.49	1.47	1.44	1.42	1.39	1.36	1.32	1.29	1.25	1.21	1.17

Figure 59



Scenario Analysis

Pro Forma Without Commercial

The Pro Forma in Figure 60 shows a hypothetical scenario without commercial cross subsidization for the development. Meanwhile, the project team lowered the deeply affordable units from 71.05% to 60.53% to simulate the actual adjustment. The DSCR shows that the commercial cross subsidy is necessary for the project to be financially feasible.

One Bedroom 30% AMI	1,815	3
One Bedroom 50% AMI	4,235	7
One Bedroom 60% AMI	1,210	2
One Bedroom 80% AMI	1,210	2
Two Bedroom 30% AMI	4,300	5
Two Bedroom 50% AMI	36,190	16
Two Bedroom 60% AMI	30,912	6
Two Bedroom 80% AMI	2,576	2
Three Bedroom 30% AMI	8,750	7
Three Bedroom 50% AMI	20,000	16
Three Bedroom 60% AMI	10,304	8
Three Bedroom 80% AMI	2,576	2
Total	122,263	76
50% Low Income Housing %		71.05%

YEAR 1 - 15 OPERATING PRO FORMA																
Increase	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	
Income 2%																
Residential income	\$ 877,314	\$ 894,860	\$ 912,757	\$ 931,013	\$ 949,633	\$ 968,626	\$ 987,998	\$ 1,007,758	\$ 1,027,913	\$ 1,048,471	\$ 1,069,441	\$ 1,090,830	\$ 1,112,646	\$ 1,134,899	\$ 1,157,597	
Commercial gross income	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Gross Potential Income	\$ 877,314	\$ 894,860	\$ 912,757	\$ 931,013	\$ 949,633	\$ 968,626	\$ 987,998	\$ 1,007,758	\$ 1,027,913	\$ 1,048,471	\$ 1,069,441	\$ 1,090,830	\$ 1,112,646	\$ 1,134,899	\$ 1,157,597	
Vacancy	5% \$ 43,866	\$ 44,743	\$ 45,638	\$ 46,551	\$ 47,482	\$ 48,431	\$ 49,400	\$ 50,388	\$ 51,396	\$ 52,424	\$ 53,472	\$ 54,541	\$ 55,632	\$ 56,745	\$ 57,880	
Bad Debt	2% \$ 17,546	\$ 17,897	\$ 18,255	\$ 18,620	\$ 18,993	\$ 19,373	\$ 19,760	\$ 20,155	\$ 20,558	\$ 20,969	\$ 21,389	\$ 21,817	\$ 22,253	\$ 22,698	\$ 23,152	
Effective Gross Income	\$ 815,902	\$ 832,220	\$ 848,864	\$ 865,842	\$ 883,159	\$ 900,822	\$ 918,838	\$ 937,215	\$ 955,959	\$ 975,078	\$ 994,580	\$ 1,014,472	\$ 1,034,761	\$ 1,055,456	\$ 1,076,565	
Expenses 3%																
Administrative	\$ 171,557	\$ 176,704	\$ 182,005	\$ 187,465	\$ 193,089	\$ 198,882	\$ 204,848	\$ 210,994	\$ 217,323	\$ 223,843	\$ 230,558	\$ 237,475	\$ 244,600	\$ 251,937	\$ 259,496	
Maintenance	\$ 182,909	\$ 188,396	\$ 194,048	\$ 199,870	\$ 205,866	\$ 212,042	\$ 218,403	\$ 224,955	\$ 231,704	\$ 238,655	\$ 245,815	\$ 253,189	\$ 260,785	\$ 268,608	\$ 276,666	
Resident Services	\$ 12,000	\$ 12,360	\$ 12,731	\$ 13,113	\$ 13,506	\$ 13,911	\$ 14,329	\$ 14,758	\$ 15,201	\$ 15,657	\$ 16,127	\$ 16,611	\$ 17,109	\$ 17,622	\$ 18,151	
Utilities	\$ 129,616	\$ 133,504	\$ 137,510	\$ 141,635	\$ 145,884	\$ 150,260	\$ 154,768	\$ 159,411	\$ 164,194	\$ 169,119	\$ 174,193	\$ 179,419	\$ 184,801	\$ 190,345	\$ 196,056	
Replacement Reserves	2% \$ 41,870	\$ 42,707	\$ 43,562	\$ 44,433	\$ 45,322	\$ 46,228	\$ 47,153	\$ 48,096	\$ 49,057	\$ 50,039	\$ 51,039	\$ 52,060	\$ 53,101	\$ 54,163	\$ 55,247	
Insurance	\$ 88,088	\$ 90,731	\$ 93,453	\$ 96,256	\$ 99,144	\$ 102,118	\$ 105,182	\$ 108,337	\$ 111,587	\$ 114,935	\$ 118,383	\$ 121,934	\$ 125,592	\$ 129,360	\$ 133,241	
Taxes	8% \$ 70,185	\$ 71,589	\$ 73,021	\$ 74,481	\$ 75,971	\$ 77,490	\$ 79,040	\$ 80,621	\$ 82,233	\$ 83,878	\$ 85,555	\$ 87,266	\$ 89,012	\$ 90,792	\$ 92,608	
Total Operating Expenses	\$ 696,226	\$ 715,992	\$ 736,329	\$ 757,253	\$ 778,781	\$ 800,932	\$ 823,722	\$ 847,172	\$ 871,300	\$ 896,126	\$ 921,671	\$ 947,955	\$ 975,000	\$ 1,002,829	\$ 1,031,464	
Net Operating Income	\$ 119,676	\$ 116,228	\$ 112,536	\$ 108,589	\$ 104,378	\$ 99,890	\$ 95,116	\$ 90,043	\$ 84,659	\$ 78,952	\$ 72,909	\$ 66,517	\$ 59,761	\$ 52,627	\$ 45,101	
Annual Must-Pay Debt Service	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	\$ 142,239	
Initial Cash Flow	\$ (22,562)	\$ (26,010)	\$ (29,703)	\$ (33,650)	\$ (37,861)	\$ (42,349)	\$ (47,123)	\$ (52,196)	\$ (57,580)	\$ (63,286)	\$ (69,330)	\$ (75,722)	\$ (82,478)	\$ (89,612)	\$ (97,138)	
Must-Pay DSCR	0.84	0.82	0.79	0.76	0.73	0.70	0.67	0.63	0.60	0.56	0.51	0.47	0.42	0.37	0.32	

Figure 60

Community Outreach

The project team seeks to create attractive spaces residents can call home through community engagement activities. Meaningful community engagement is the cornerstone of the successful implementation of the project. The community outreach plan will detail the process to engage the residents of North Smithfield, especially those that are hard to reach.

Engagement

In order to transform the historic Andrews Mill to an attractive space for future residents and the people of North Smithfield, meaningful community engagement activities that seek to induce spontaneous response from residents are of paramount importance. The project team aspires to understand the local community as well as building trust with the community members.

Since the Andrews Mill project is catered to mostly families in the area, their needs and opinions will guide the programming and design of community spaces as well as other aspects that will enable families to live in Andrews Mill comfortably.

The goal of the community outreach efforts is to gauge the items the community deems important for the town, and whether there are unmet needs.

Target Audience

The community outreach should target residents in North Smithfield. This is defined as those who live in North Smithfield, work or go to school in North Smithfield, or frequently visit North Smithfield for various reasons, and those who are willing to provide information about the town. The project team also recommends including parts of Woonsocket for the outreach events.

Further, reaching out to those that are hard to reach becomes extremely imperative in context. Teaming up with local community-based non-profit organizations is proven a more effective method for reaching out to those who are usually marginalized.

Preliminary Engagement

The project team's preliminary engagement with several immigrant and low-income residents revealed that basic needs are mostly satisfied in North Smithfield. Community members identified grocery stores, banks, gas stations, and pharmacies as the most important businesses in their daily lives. Although these essential needs have been satisfied, residents are looking for more exciting stores as well as businesses that their kids can enjoy. Children's play space is another important item residents identified when considering their next home.

Community space has also been identified as one of the most important items for community living. In particular, community center and community events are said to be capable of bring residents together as well as sharing resources. Residents also revealed that space and rooms are the most important when examining an apartment. Residents prefer more spacious apartments as well as more storage space.³³

Future Engagement

Further engagement efforts could include intercept surveys, phone interviews, in-person interviews, group interviews, community meetings, community workshops and other activities.

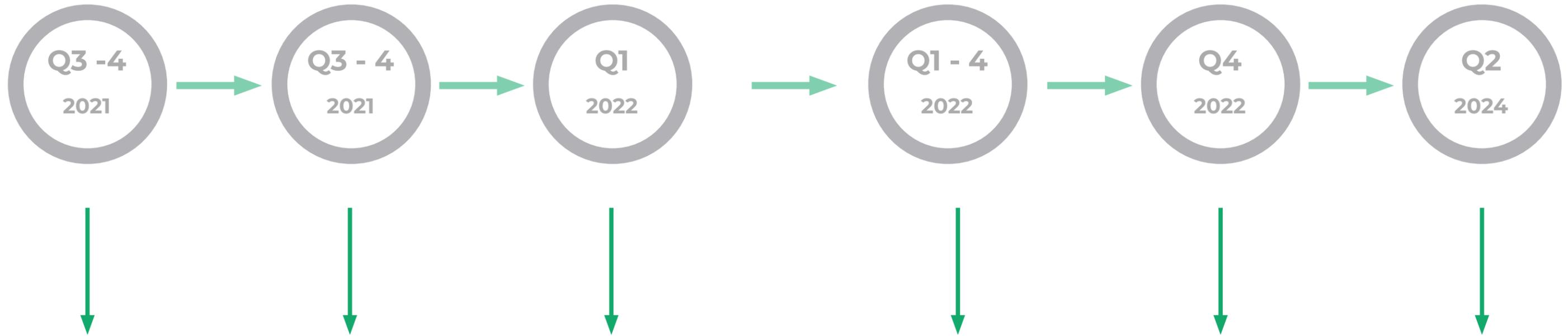


Figure 61

"I want my kid to have fun. I want to see something they can enjoy"

- Yameliz, North Smithfield Community Resident

Development Timeline



Due Diligence, Design and Planning

Because the site is located within a flood zone, environmental impact studies shall be conducted. Other feasibility studies such as transportation impact studies will be conducted due to commercial uses proposed in the plan. These studies shall be conducted and finished during the third and the fourth quarters of 2021.

Design and planning of the site will also be finalized to prepare for the next phase of the project development.

Community Engagement

At the same time when all impact and feasibility studies are being conducted, the project team will conduct community engagement activities. These activities shall include surveying and interviewing residents, as well as organizing community meetings and community workshops to identify the needs and concerns of the community. These activities will inform the plan and the design of the project leading to minor modifications prior to project submission.

Permitting Processes

All applicable permit applications shall be submitted for review by the end of the fourth quarter in 2022. Please see the next spread that lays out the multi-step phasing of permitting.

Development Review

The project review processes will commence immediately after submission of the permit applications. The review might address transportation, environmental impact, LEED compliance urban design, historic resources and preservation, and infrastructure systems.

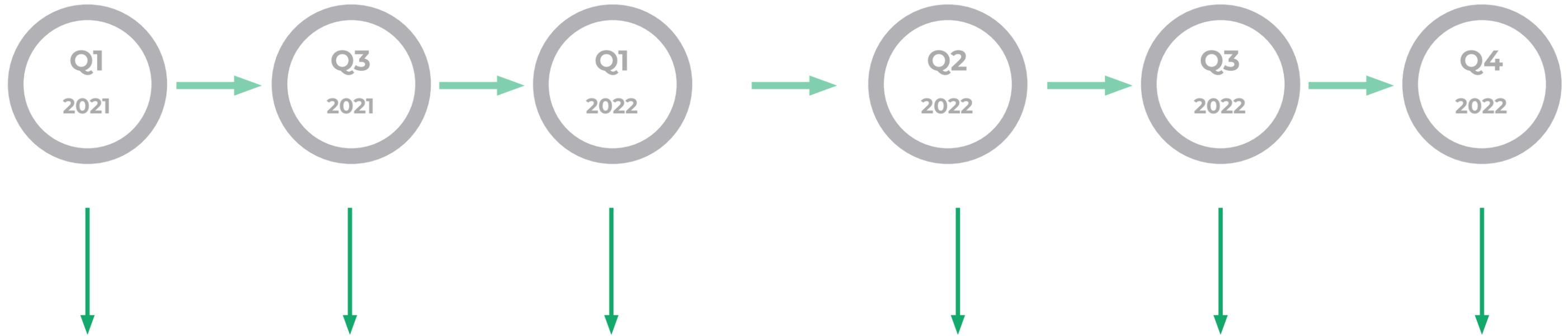
Demolition and Construction

Demolition, excavation, and construction shall commence after all applicable permits have been issued before the fourth quarter of 2022. The construction of 76 units will immediately follow the demolition of the periphery structures of the mill building as well as the excavation.

Project Completion and Opening

The project construction will take approximately 20 months to be completed and will be finished in the last quarter of 2023. The project will be opened and available for move-in immediately after the project completion.

Permitting Timeline



Historic Approval Part I

Historic approval is based upon the historic nature of Andrews Mill and the scope of the development project as a form of historic adaptive reuse

This process generally takes just a couple of months

NWBRV already has this approval

Historic Approval Part II

Historic approval is based upon the historic nature of Andrews Mill and the scope of the development project as a form of historic adaptive reuse

For Part II, submission to the state’s historic preservation commission is necessary. This is generally an expedited process that takes just a couple of months

This permitting is necessary to close on financing because investors want this fiscal insurance

Wetlands Permitting

Wetlands permitting is necessary due to the development’s site being located adjacent to wetlands. This process generally takes up to 90 days

Based on NWBRV’s experience with similar historic adaptive reuse projects adjacent to wetlands, there are no issues nor any delays anticipated with this process³⁴

Comprehensive Permit

Per the General Laws of Rhode Island §45-53-4 Procedure for approval of construction of low or moderate income housing: “Any applicant proposing to build low or moderate income housing [in which at least 25% of housing is low or moderate income housing] may submit to the local review board asingle application for a comprehensive permit to build that housing in lieu of separate applications to the applicable local boards”. This expedited process generally takes up to 90 days.³⁵

Assemblage of Financing Subsidies

This technically not a permit, but this is a critical part of the general permitting process

Rhode Island does not have a One-Stop Affordable Housing Finance Application like Massachusetts, and so the assembling of financing subsidies needs to be done in different parts and phases for RI projects

This does not start in earnest until the comprehensive permit has been achieved

Building Permits & Inspections

This permitting process begins once all prior permits have been received and soon before construction is ready to begin. This process generally takes up to 30 days

Endnotes

- 1 Interview with Yameliz Pares. Conducted by Wenzheng Wang. March 24th 2021.
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- 4 Google Maps. 2021.
- 5 Interview with Joe Garlick. Conducted by David Bemporad, Julian Huertas, Seoyoung Lee, Clara Wang and Hanxin Xing. March 2021
- 6 U.S. Census Bureau. 2019. 2015-2019 American Community Survey 5-year Public Use Microdata Samples Retrieved from data.census.gov
- 7 Rhode Island Emergency Management Agency. n.d. Floodplain Mapping. <http://www.riema.ri.gov/resources/citizens/mitigation/mapping.php>
- 8 Amaral, B., & Writer, B. (2018, April 27). Report: Racial, ethnic disparities found IN R.i. traffic stops, from <https://www.providencejournal.com/news/20180427/report-racial-ethnic-disparities-found-in-ri-traffic-stops>
- 9 Seoane, S. (2020, June 07). North Smithfield residents, officials weigh in on death of George Floyd, from <https://nrinow.news/2020/06/04/north-smithfield-residents-officials-weigh-in-on-death-of-george-floyd/>
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- 12 North Smithfield Zoning Code, Section 12, Mixed Use Districts (MU). https://www.nsmithfieldri.org/sites/g/files/vyhlif3596/f/uploads/section_12.pdf
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- 14 Town of North Smithfield, RI. 2019. Town of North Smithfield Official Zoning Map. https://www.nsmithfieldri.org/sites/g/files/vyhlif3596/f/uploads/land_use_map_4_-_official_zoning_map_final_0.pdf
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- 16 Rhode Island Public Transit Authority. (n.d.). RIPTA 59X. <https://www.ripta.com/routes/59/>
- 17 Rhode Island Statewide Planning Program. 2020. Rhode Island Long Range Transportation Plan. <http://planri.com/documents.asp>
- 18 U.S. Census Bureau. 2019. 2015-2019 American Community Survey 5-year Public Use Microdata Samples. Commuting Flows. Retrieved from data.census.gov
- 19 Interview with Engage North Smithfield. Conducted by David Bemporad, Julian Huertas, Seoyoung Lee, Clara Wang and Hanxin Xing. March 26th 2021
- 20 State of Rhode Island 2021 Qualified Allocation Plan
- 21 Site Photography by Julian Huertas and Wenzheng Wang. February 2021.
- 22 United States Department of the Interior. 2018. Andrews Mill Company Plant. National Park Service. National Register of Historic Places Registration Form. http://www.preservation.ri.gov/pdfs_zips_downloads/national_pdfs/north_smithfield/nosm_great-road-761_andrews-mill.pdf
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- 33 Interview with Yameliz Pares. Conducted by Wenzheng Wang. March 24th, 2021.
- 34 Interview with Joe Garlick. Permitting Timeline & Process. Conducted by Julian Huertas. April 3rd, 2021.
- 35 General Laws of Rhode Island §45-53-4. Procedure for approval of construction of low- or moderate-income housing.

Andrews Mill Project

2021 AFFORDABLE HOUSING DEVELOPMENT COMPETITION
FEDERAL HOME LOAN BANK OF BOSTON