HOME FOR ALICE

LEFT: UDBS AR HOME LAB students engaging with the mayor of a Timberlands municipality to understand regional housing challenges and related initiatives.

In the Spring of 2021 twelve undergraduate BArch students enrolled in a 3 CU elective seminar course, *A Just Home for the Arkansas Timberlands*, initiated research and a community engagement process to better understand the 19 Counties that comprise the Arkansas Timberlands.

Offered during the COVID 19 Global Pandemic, students had the opportunity to connect with community members, stakeholders, public officials, civic leaders, and experts from the timber industry via Zoom each week. These interviews and dialogue sessions complemented a body of research that emerged over the course of the semester, and into the summer through paid internships.







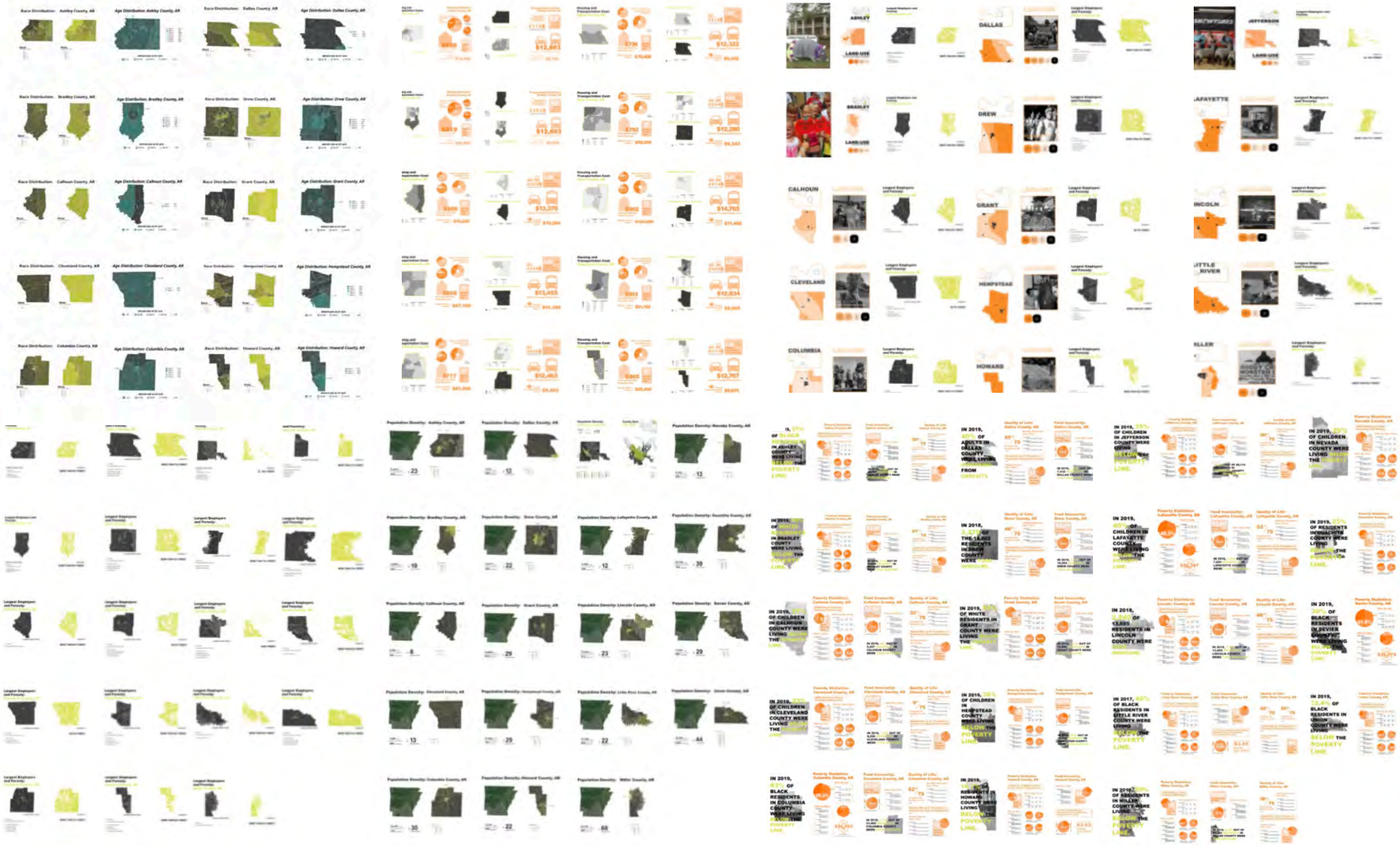

The purpose of both engagement and research was to obtain information that could be utilized in collaborative design processes employed in the development of a home prototype that could contribute to changing the narrative surrounding affordable housing in the Timberlands Region.

Without the option to visit the region in person during the pandemic, initial sureveys of housing were completed using Google Earth to create an inventory of typologies. The inventories developed for each county and municipality proved to be an important tool during remote engagement. Students could remotely "walk through" communities with the assistance and guidance of stakeholders and residents. Image catalogs were created to objectively represent qualitative aspects of home important to each of the communities; how people use their carports, front porches, where their front doors are located, how front and back yards are treated, etc. These are all important aspects of a neighborhood that informed students' thinking about how residents in the region want to live.

Excerpt from/Example of housing typology inventory generated by students in support of remote engagement.




Examples of student work from the Timberlands Atlas: *data and demographic studied and mapped across the region by county.*



Complementing qualitative observations made through remote channels, students were mobilized in groups to explore demographic data and map quantitative information in the creation of a Timberlands Atlas

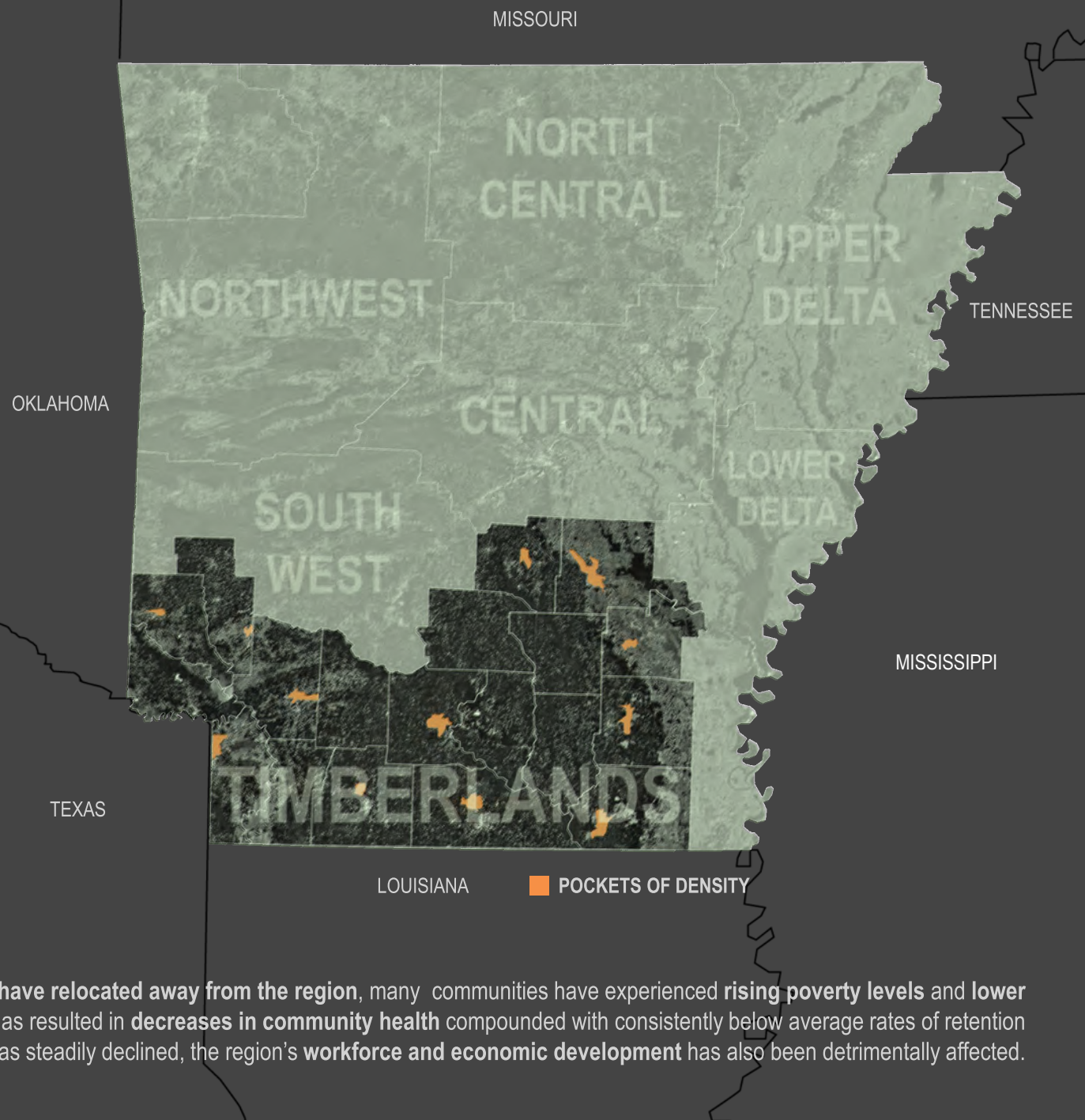
Data and demographics were graphically represented through the lens of a capitals framework that included housing and transportation costs, population density, food insecurity, poverty, quality of life, land-use, forestry and industry, and age distribution. Work was shared collectively in student led conversations about place, people, technology, and typology.

Examples of developed/refined mappings/graphics included with the Timberlands Atlas

As work advanced in the **Just Home for the Arkansas Timberlands Seminar**, the objective of realizing a **culturally sensitive** and **regionally specific home prototype was promoted through the** lens of the Community Capitals Framework. Developed by Cornelia Butler Flora and Jan Flora in 2008, the framework considers the impact of financial, human, cultural, and social capital in determining a community's well-being. That multifaceted lens informed refinement of remote research and development of appropriate strategies for future field work and in person community engagement.

The **Arkansas Timberlands** (also called Southern Arkansas or Southwest Arkansas) is a region of the state of Arkansas encompassing the area south of the Ouachita Mountains, south of Central Arkansas and west of the Arkansas Delta. Made up of 19 unique counties, the Timberlands region of Arkansas is steeped in **culture and history**, and businesses have capitalized on the abundance of **natural resources** in the region for over a century.

WHAT WAS LEARNED IS THAT 70% OF COUNTIES IN THE TIMBERLANDS REGION FALL IN THE BOTTOM HALF OF RANKINGS FOR QUALITY OF LIFE IN ARKANSAS



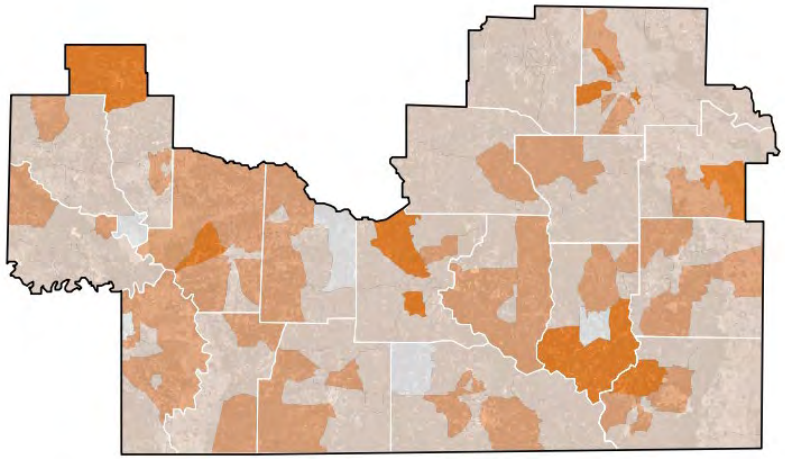
However, as technology has evolved and **industries have relocated away from the region**, many communities have experienced **rising poverty levels** and **lower quality of life** over the last several decades. This has resulted in **decreases in community health** compounded with consistently below average rates of retention and performance in public schools. As population has steadily declined, the region's **workforce and economic development** has also been detrimentally affected.

Examples of existing housing in the Timberlands region of Arkansas photographed by paid student interns in Summer 2021.

HOUSING

regional cost of living data

16-30% 30-44% 44-58% 58+%



County Level Housing Cost (% of income)

Ashley = 29	Dallas = 26	Jefferson = 27	Nevada = 30
Bradley = 26	Drew = 29	Lafayette = 27	Ouachita = 26
Calhoun = 32	Grant = 22	Lincoln = 27	Sevier = 25
Cleveland = 28	Hempstead = 30	Little River = 24	Union = 24
Columbia = 25	Howard = 28	Miller = 25	

AND, THE MAJORITY OF HOUSEHOLDS IN THE TIMBERLANDS REGION SPEND 60% OF THEIR INCOME ON HOUSING AND TRANSPORTATION ALONE.

In the Timberlands region, median home values average 45% less than Arkansas averages, and 69% less than national averages, at only $76,441. While this may suggest greater affordability of housing units, the stagnation of incomes and limited access to financial capital within the region make home ownership and resulting generational wealth building a distant reality to most families.

THE IMPERITIVE QUESTION:

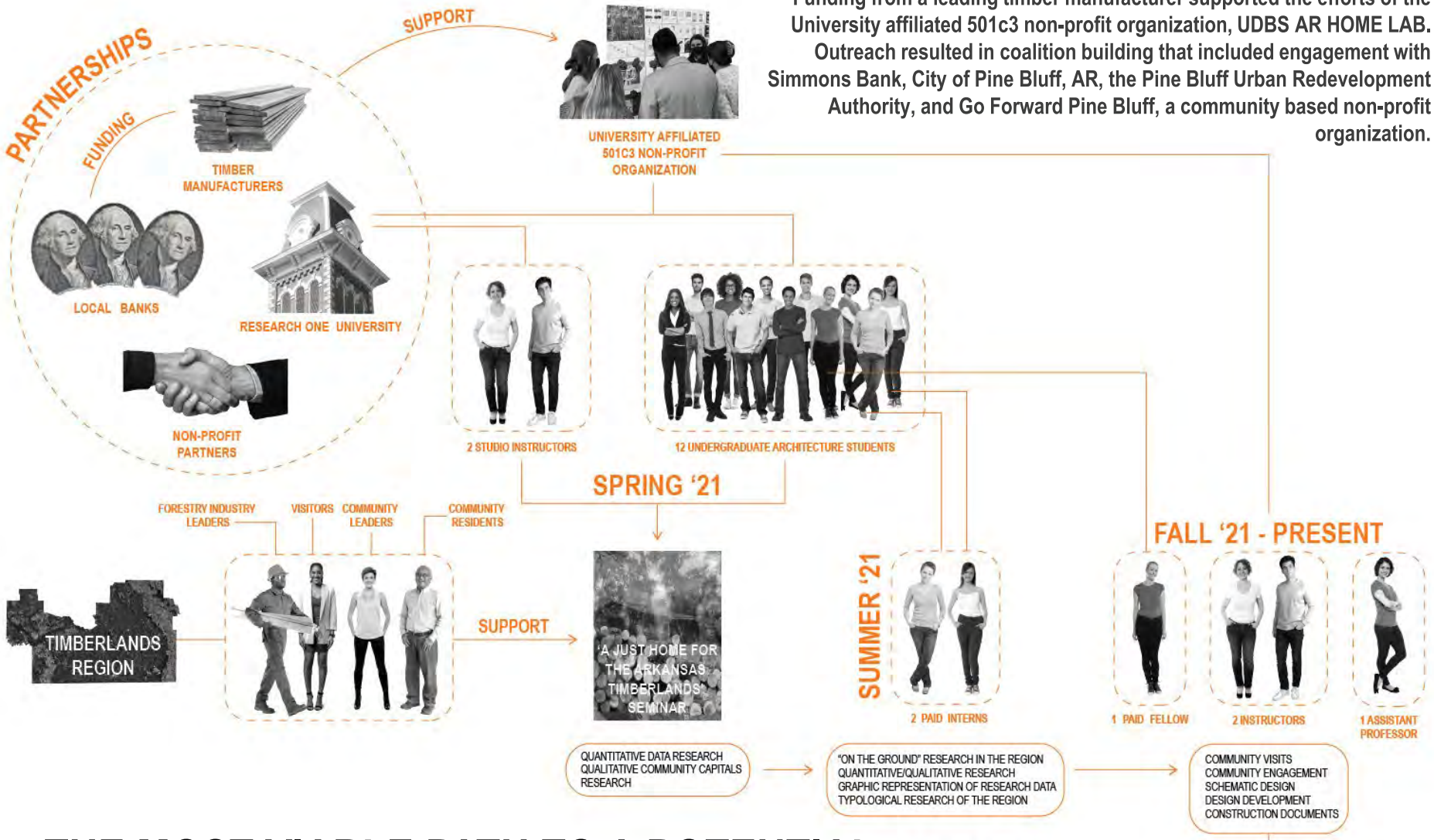
HOW CAN AFFORDABLE, REGIONALLY SPECIFIC HOUSING DESIGN BECOME A REALITY FOR THE TIMBERLANDS REGION?

Following the 'A Just Home for the Arkansas Timberlands' seminar semester, student work continued into the summer with the hiring of two full-time, paid student interns. Working under the direction of faculty in a university affiliated non-profit 501c3 design-build practice, the UDBS AR HOMRE LAB, the team travelled to the Timberlands Region to verify and expand upon remote research executed during the academic year. Previously engaged stakeholders were contacted for on-site meetings in communities to discuss team and coalition building necessary for realization of a replicable home prototype that could meet the needs of a specific and significant sector of those who were housing insecure and poised for first time home ownership.

Photograph taken during field research and on-site community engagement, Pine Bluff, Arkansas

BUILDING THE COLLABORATIVE FRAMEWORK

Funding from a leading timber manufacturer supported the efforts of the University affiliated 501c3 non-profit organization, UDBS AR HOME LAB. Outreach resulted in coalition building that included engagement with Simmons Bank, City of Pine Bluff, AR, the Pine Bluff Urban Redevelopment Authority, and Go Forward Pine Bluff, a community based non-profit organization.



THE MOST VIABLE PATH TO A POTENTIAL SOLUTION WAS FORGED BY PARTNERSHIPS OF DIFFERENCE PREDICATED ON EXPERIENCE AND TRUST IN COLLECTIVE INTELLIGENCE.

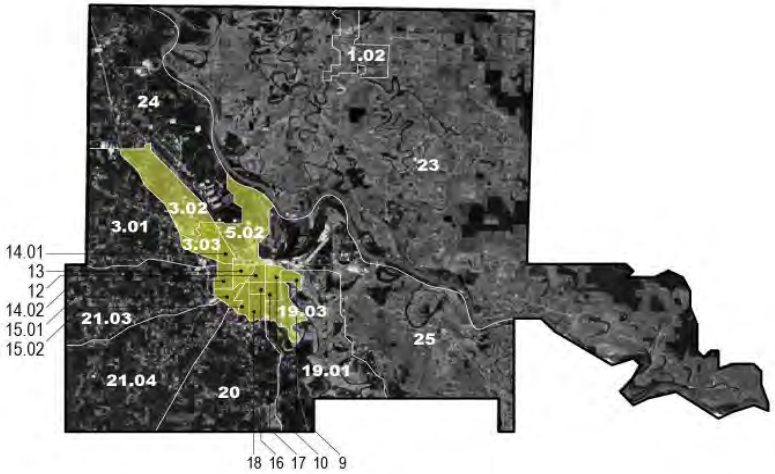
Population Density:
Jefferson County, AR

66,824 people
914 square miles

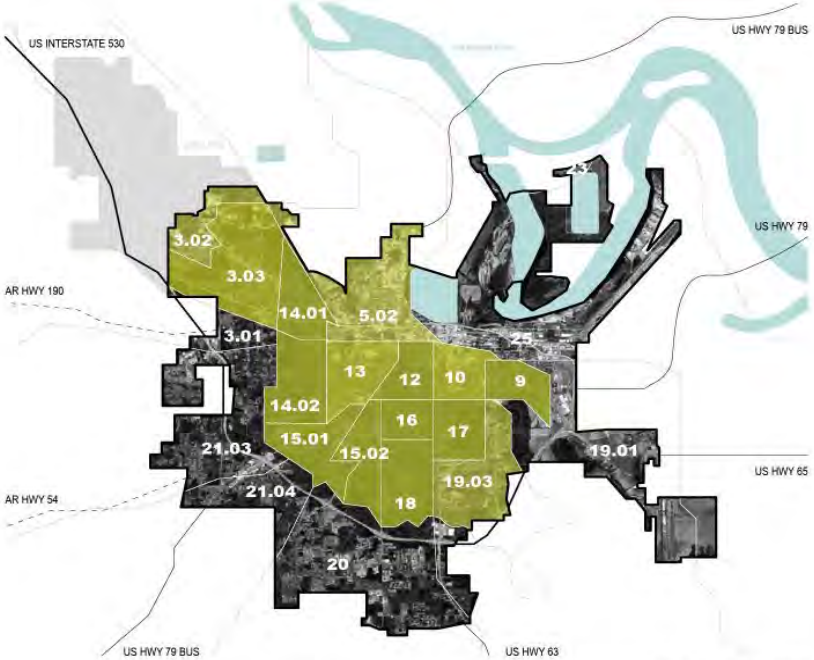
= 73
pop. density

County Seat:
Pine Bluff

Timberlands Region
× 1



Jefferson County, Arkansas
× 7



Pine Bluff, Arkansas
× 23

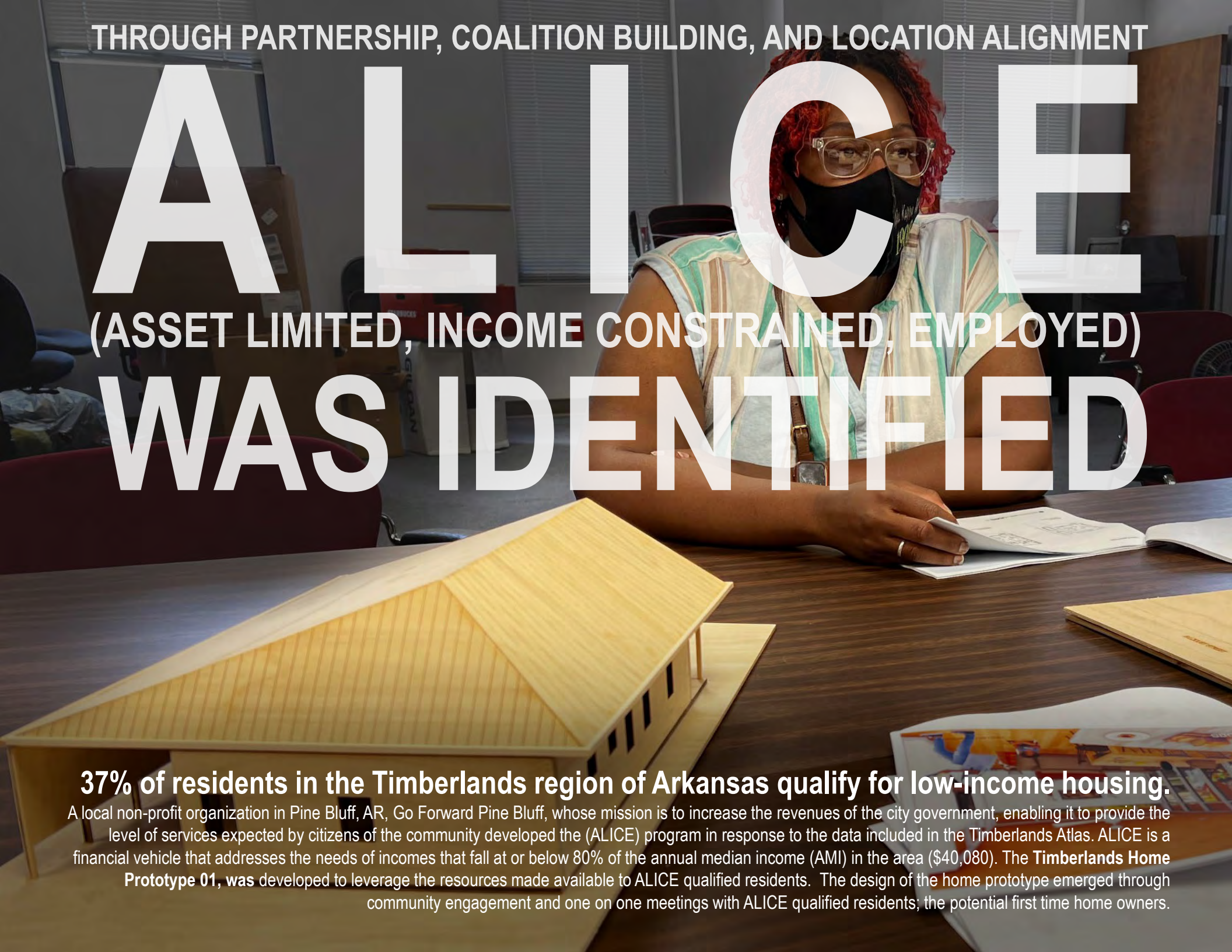
Tract (t) Level Race Distribution

R t 1.02 = 147	U t 9 = 2,672	U t 14.02 = 1,096	U t 18 = 1,659	R t 21.04 = 73
R t 3.01 = 72	M t 10 = 954	U t 15.01 = 2,267	R t 19.01 = 28	R t 23 = 6
R t 3.02 = 395	U t 12 = 1,452	U t 15.02 = 1,853	R t 19.03 = 422	R t 24 = 50
M t 3.03 = 800	M t 13 = 892	U t 16 = 3,046	R t 20 = 50, 116	R t 25 = 8
R t 5.02 = 225	U t 14.01 = 1,282	U t 17 = 1,766	R t 21.03 = 119	

Other Municipality
Water
US Interstate
US Highway
AR Highway

LOCATION

Partnering and Coalition Building cultivated through outreach and community engagement across the 19 counties revealed capacity strengths for a pilot project in Jefferson County, Arkansas; with a specific focus on the municipality of Pine Bluff. Situated on the Arkansas River, the municipality had once been a primary economic development generator for the state. Challenged by characteristic disinvestment, the resident population proved organized and committed to future oriented solutions.



THROUGH PARTNERSHIP, COALITION BUILDING, AND LOCATION ALIGNMENT

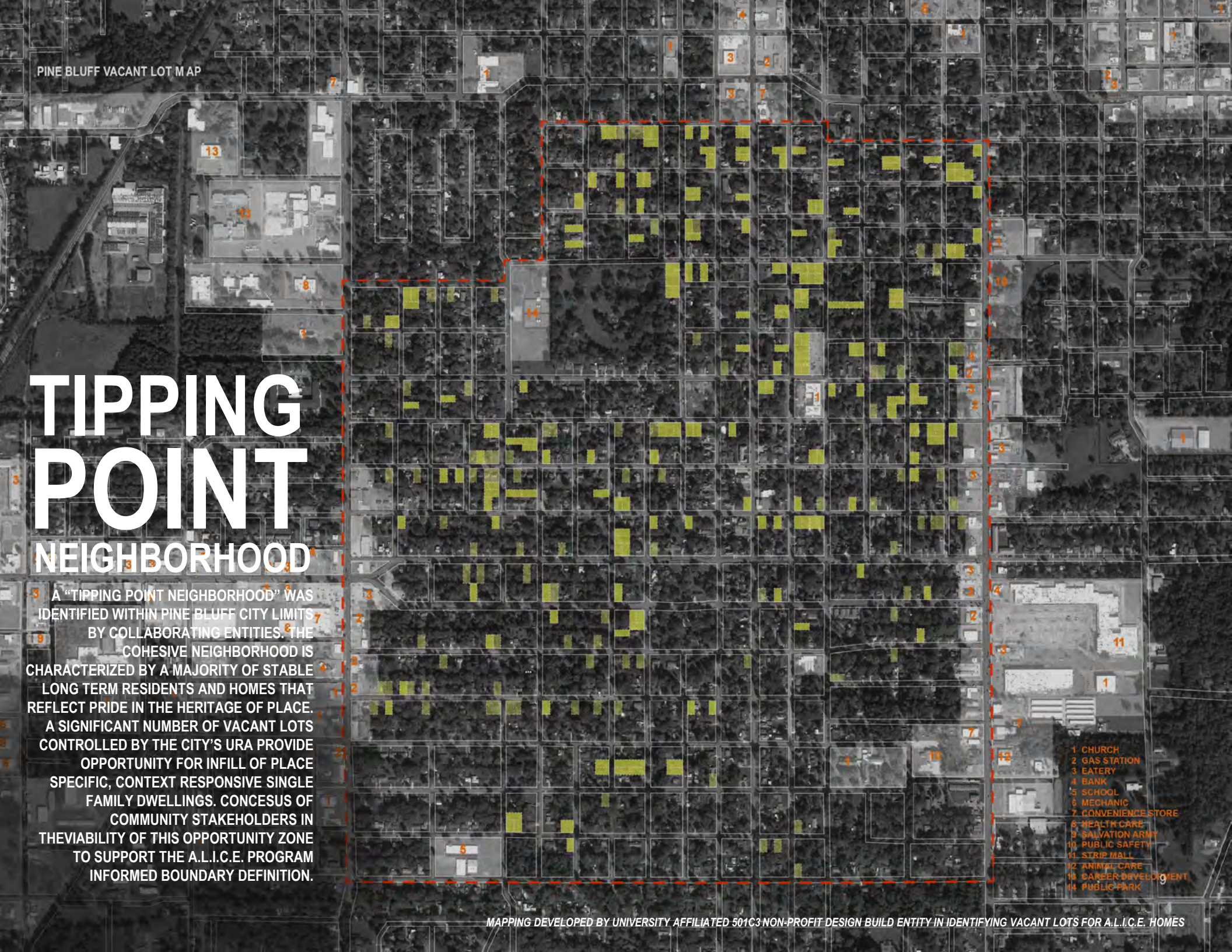
ALICE

(ASSET LIMITED, INCOME CONSTRAINED, EMPLOYED)

WAS IDENTIFIED

37% of residents in the Timberlands region of Arkansas qualify for low-income housing.

A local non-profit organization in Pine Bluff, AR, Go Forward Pine Bluff, whose mission is to increase the revenues of the city government, enabling it to provide the level of services expected by citizens of the community developed the (ALICE) program in response to the data included in the Timberlands Atlas. ALICE is a financial vehicle that addresses the needs of incomes that fall at or below 80% of the annual median income (AMI) in the area ($40,080). The **Timberlands Home Prototype 01, was** developed to leverage the resources made available to ALICE qualified residents. The design of the home prototype emerged through community engagement and one on one meetings with ALICE qualified residents; the potential first time home owners.



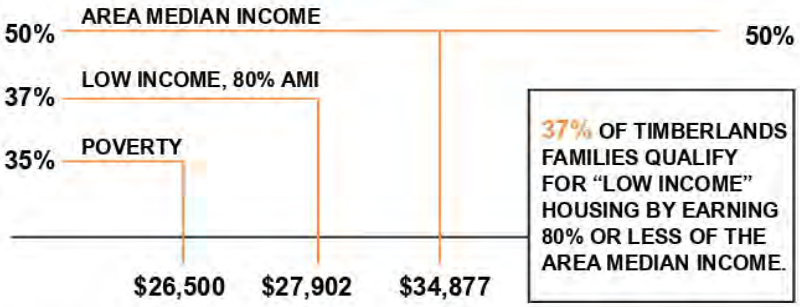
TIPPING POINT

NEIGHBORHOOD

A "TIPPING POINT NEIGHBORHOOD" WAS IDENTIFIED WITHIN PINE BLUFF CITY LIMITS BY COLLABORATING ENTITIES. THE COHESIVE NEIGHBORHOOD IS CHARACTERIZED BY A MAJORITY OF STABLE LONG TERM RESIDENTS AND HOMES THAT REFLECT PRIDE IN THE HERITAGE OF PLACE. A SIGNIFICANT NUMBER OF VACANT LOTS CONTROLLED BY THE CITY'S URA PROVIDE OPPORTUNITY FOR INFILL OF PLACE SPECIFIC, CONTEXT RESPONSIVE SINGLE FAMILY DWELLINGS. CONCESUS OF COMMUNITY STAKEHOLDERS IN THEVIABILITY OF THIS OPPORTUNITY ZONE TO SUPPORT THE A.L.I.C.E. PROGRAM INFORMED BOUNDARY DEFINITION.

MAPPING DEVELOPED BY UNIVERSITY AFFILIATED 501C3 NON-PROFIT DESIGN BUILD ENTITY IN IDENTIFYING VACANT LOTS FOR A.L.I.C.E. HOMES

REGIONAL MEDIAN INCOME: $34,877 [AMI]



REGIONAL LAND COSTS [BASED ON AREA SALES]: $24,037/ACRE
AVERAGE LOT SIZE: 0.2 ACRES [COST OF $4,807]
AVERAGE CONSTRUCTION COST: $110/SQ. FT.

AFFORDABLE MORTGAGE @ 30% A.M.I.: $872/MO.

AFFORDABLE MORTGAGE @ 30% LOW INCOME: $698/MO.

WHO ARE WE BUILDING FOR?

MEDIAN INCOME WAGE [A.M.I.]: $16.76/HOUR
- BOOKKEEPERS
- CLERKS
- TRUCK AND TRACTOR TRAILOR OPERATORS
- RETAIL SUPERVISORS
- MAINTENANCE/REPAIR WORKERS
- PARAPROS & PUBLIC EDUCATION STAFF

MEDIAN INCOME WAGE [LOW-INCOME]: $13.41/HOUR
- LABORERS/PRODUCTION WORKERS
- FOOD PREP/SERVERS
- NURSING ASSISTANTS
- RECEPTIONISTS

MEDIAN INCOME [$34,877/YEAR] *MAX. MORTGAGE: $872/MO.*		LOW INCOME [$27,902/YEAR] *MAX. MORTGAGE: $698/MO.*
$160,000	**PURCHASE PRICE**	**$122,000**
0 [+P.M.I .5%]	DOWN PAYMENT	0 [+P.M.I .5%]
3%	INTEREST RATE	3%
30 YEARS	LOAN TERM	30 YEARS
$800/YEAR	PROPERTY TAX	$800/YEAR
$800/YEAR	INSURANCE	$800/YEAR
$870/MO.	**MORTGAGE**	**$698/MO.**

HOW MUCH HOME CAN WE BUILD?

$160,000	PURCHASE PRICE	$122,000
	MINUS	
$9,600	DEVELOPER FEES [6%]	$7,320
$9,600	DESIGN FEES [6%]	$7,320
$1,600	PERMITTING [1%]	$1,220
$4,807	LAND, AVG. SIZE LOT [0.2 ACRES]	$4,807
$134,393	**CONSTRUCTION COST**	**$101,333**

DIVIDE BY COST PER SQUARE FOOT [$110/SQ. FT.]

1,222 SQ. FT. BUILDABLE AREA **921 SQ. FT.**

DETERMINING FEASIBILITY

To begin the schematic design phase of Timberlands Prototype 01, a financial pro-forma model was developed, factoring in all of the costs relative to design and construction, determining the square footage that could be built for residents in the Timberlands region making at or above 80% of the area median income (AMI), thus meeting the criteria of families engaged in the A.L.I.C.E. program. Data like incomes and housing costs gathered in the *A Just Home Seminar* informed calculation of this model for each county of the Timberlands.

CONSIDERING REGIONAL SPECIFICITY

TYPOLOGICAL ROOFS

TYPOLOGICAL RIDGE AND EAVE HEIGHTS

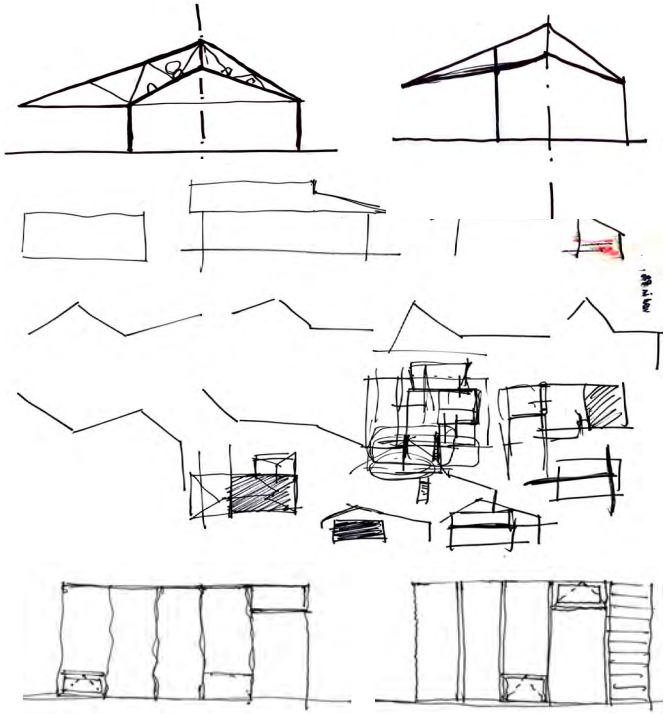
TYPOLOGICAL SIDE ENTRY

The objective of all partners in the development of the prototype was to promote culturally appropriate and regionally specific strategies. Schematic design was informed by the municipality's-built capital; existing housing. Typological characteristics were studied, documented, and catalogued on visits to the regions and neighborhood. Roof profiles, scalar characteristics, façade elements, entry points, and scalar elements informed the design of the Timberlands Prototype 01.

A.L.I.C.E. PROGRAM RESIDENT INFLUENCE IN DESIGN



Images from community engagement meetings with residents in the A.L.I.C.E. program. The ongoing design of Timberlands Prototype 01 was introduced to residents through models and drawings and discussed for its cultural relevance in the community.

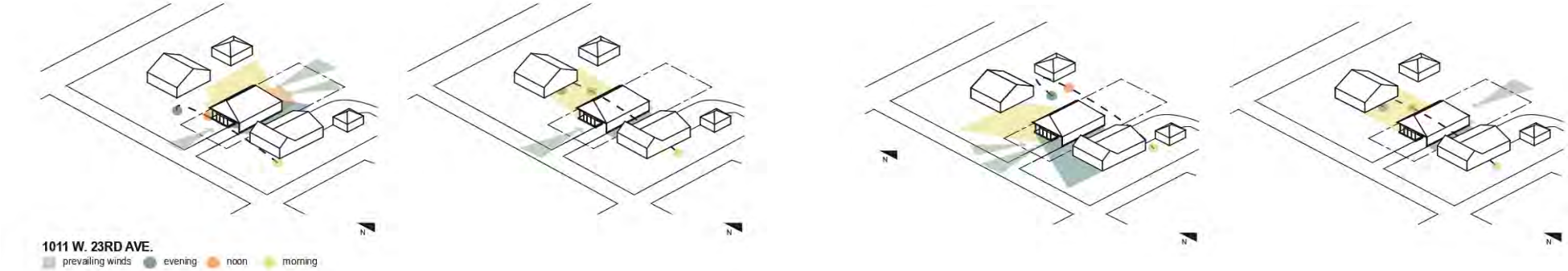



Iterative sketches and drawings of spatial organization, form, siting, massing, façade and fenestration informed by analysis and potential resident feedback.

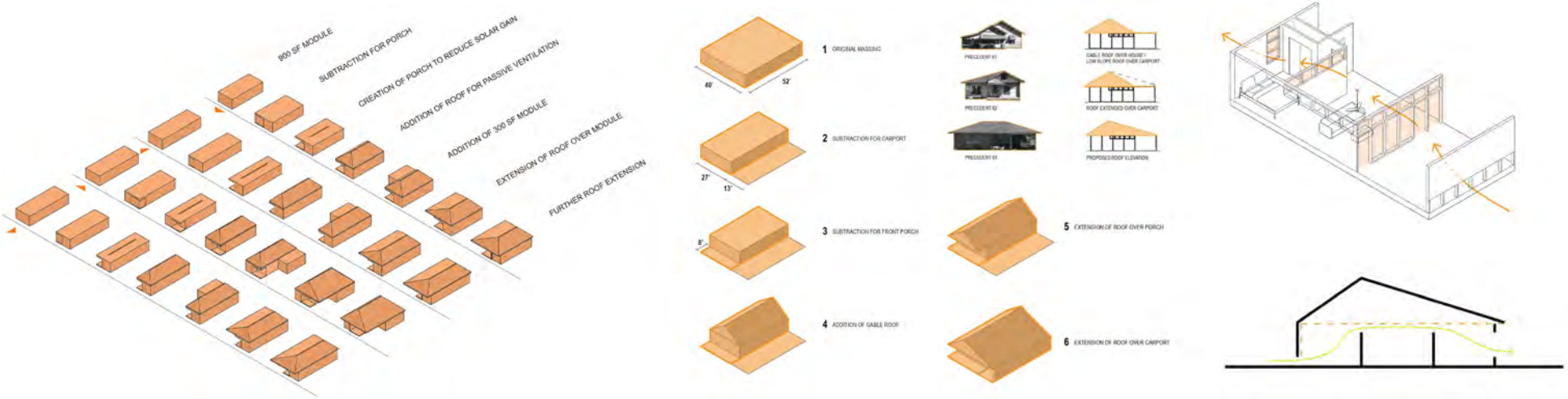
RESIDENT ENGAGEMENT AND TYPOLOGY STUDIES IN CONTEXT INFORMED DESIGN DEVELOPMENT

The design process relied heavily on engagement with potential homeowners. Adjustments to the design were made in real time with residents present.

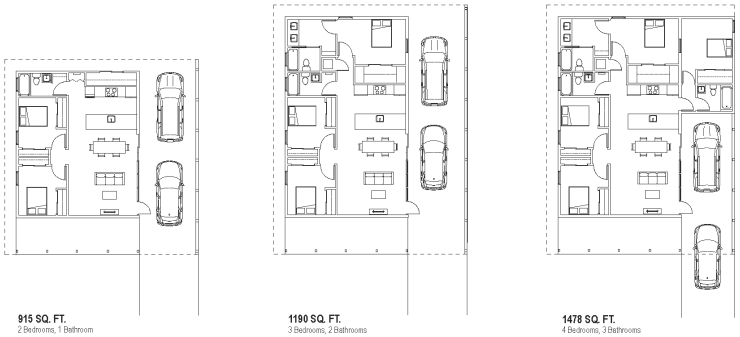
FORMAL LANGUAGE ROOTED IN ENVIRONMENTAL RESPONSE AND ADAPTABILITY



Environmental studies of Timberlands Prototype 01 on a characteristic infill lot in Pine Bluff. The design has been studied against the typical sun path throughout the year, and the prototype can be configured, mirrored, or adjusted to best fit the given site and benefit the homeowner by keeping long term costs down.

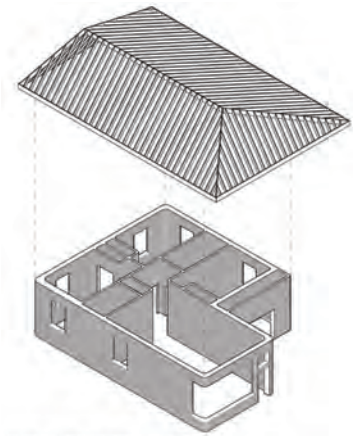


Early massing studies of the prototype in every cardinal direction. Considering the configuration of the plan, position of the carport, and roof shape all contribute to the environmental performance of the prototype when built on individual sites across Pine Bluff and the South Arkansas region.

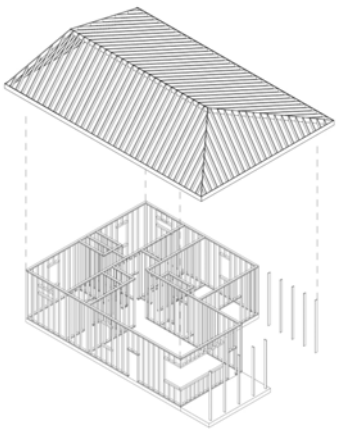


Passive heating and cooling strategies influence space and form in the Timberlands Prototype 01. Lifting the carport wall off of the ground and providing operable windows in the living space and bedroom allow for passive ventilation across the short direction of the home. Strategies like this can contribute to lower utility costs for the homeowner, further reinforcing affordability and wealth building in families engaged in the ALICE program.

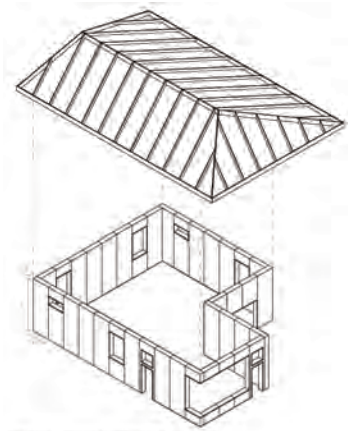
RESOLUTION OF CONSTRUCTION TECHNOLOGIES



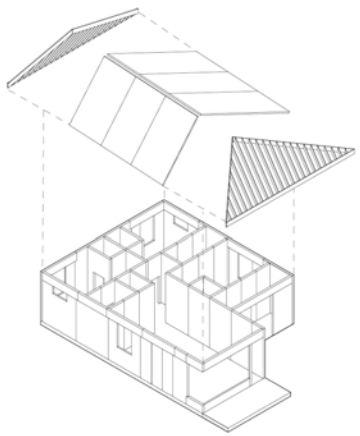
3D PRINTED + 2X4 ROOF CONSTRUCTION



STICK FRAME CONSTRUCTION



SIP PANEL + 2X4 ROOF CONSTRUCTION



CLT PANEL CONSTRUCTION

ABOVE: studies of construction material technologies and their impact on time and cost were studied during the design process of Timberlands Prototype 01; BELOW: framing model of the traditional stick-built construction strategy chosen for the initial prototype

Every aspect of the design has been studied for its compliance with the intention to remain affordable, regionally specific, replicable, and culturally sensitive. Multiple construction technologies were studied for their impacts on time required, level of construction skill required, and cost. Traditional stick-built construction was chosen as the technique for the first construction due to capacities of contractors in the area.

ROOF

PREFINISHED STANDING SEAM METAL PANELS
AIR BARRIER
5/8" OSB ROOF SHEATHING WITH 15 LB. ROOFING FELT
PREFABRICATED WOOD TRUSSES

R39 CEILING

R38	12" MINIMUM BATT INSULATION
R1	3/4" 5-PLY PLYWOOD

R4 WINDOWS

MARVIN ELEVATE
LOW-E INSULATED GLAZING

R28 EXT. WALL

R .8	NATURAL FINISHED CYPRESS WOOD PANELS
R .45	5/8" OSB WALL SHEATHING
R 5	TYVEK HOME WRAP
R 21	5.5" BATT INSULATION
R .45	5/8" GYPSUM WALL PANEL

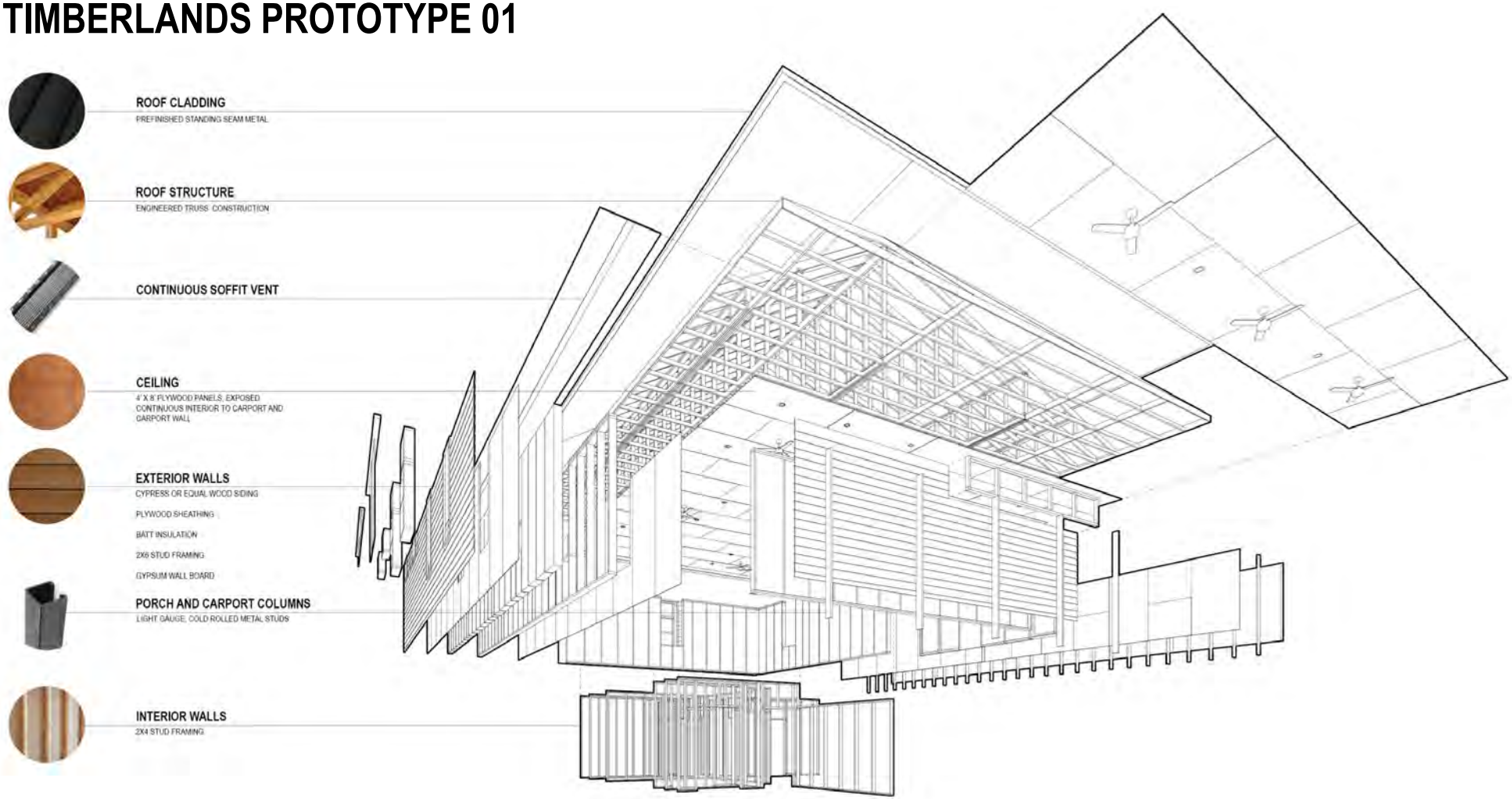
FLOOR

R .2	LUXURY VINYL TILE AT FINISH FLOOR
R .6	CONCRETE SLAB ON GRADE
R .2	MINIMUM 6" COMPACTED GRAVEL

Section perspective drawing showing the interior of Timberlands Prototype 01, emphasizing the livability of the spaces as well as the benefit of cross ventilation through operable windows in the carport and bedroom.

THE FINAL DESIGN OF TIMBERLANDS PROTOTYPE 01 IS A RESULT OF AN ITERATIVE DESIGN PROCESS THAT CONSIDERED CULTURAL RELEVANCE, ENVIRONMENTAL CONSCIOUSNESS, REGIONAL SPECIFICITY, AND COMMUNITY ENGAGEMENT. IT IS THE RESULT OF A COLLECTIVE EFFORT INITIATED IN A 3CU HOUSING SEMINAR AND CARIIED FORWARD THROUGH PAID UDBS AR HOME LAB STUDENT INTERNSHIPS.

TIMBERLANDS PROTOTYPE 01



Exploded Perspective Drawing Illustrating systems and technologies utilized to meet the initial investment proforma. The chassis developed for the prototype can be utilized for the construction of a two, three, or four bedroom home.

Groundbreaking after clearing and grubbing of the pilot site where three homes will be implemented; one of each – a two, three and four bedroom prototype in variable solar orientation to test strategies employed .

VIEW OF THE THREE TIMBERLANDS 01 PROTOTYPES DEPLOYED ON ON THE 17TH STREET SITE IN PINE BLUFF, ARKANSAS