

ABSTRACT

Title of Thesis: MISSING TEETH: THE HOLES IN OUR COMMUNITIES
Hannah Elizabeth Gross, Master of Architecture, 2025

Thesis Directed By: Dr. Joseph Williams, Maryland School of Architecture,
Planning, and Preservation

The events of hurricane Helene in September 2024 brought to the front pages an area of the country that is often forgotten despite being so close to the populated east coast. According to the Appalachian Regional Commission, there were 26.4 million people living in the region known as Appalachia in 2022.¹

Many places in Appalachia could be described as “under-resourced.” The overall poverty rate is 14.3% compared to the US national average of 12.1%, and spikes upwards of 30% or more in areas like eastern Kentucky or Southwest Virginia² (fig 1). Additionally, Appalachia experiences a specific set of problems: environmental issues related to the mining industries and an increased frequency of 100-year storms, and depopulation instead of gentrification. The shrinking coal industry can no longer provide enough jobs, disastrous floods destroy current buildings, and these diminishing resources drive younger people out who would otherwise be a resource to support an

¹ Population and age in Appalachia, June 26, 2024.

² Income and poverty in Appalachia, July 2, 2024.

aging population. While the combination of issues could be unique to this area, they apply to many types of under-resourced communities.

But this is not the whole picture: many people of Appalachia are characterized by strong connections to their land, history, and each other. Together they have laid the groundwork to retain talent, rebuild after floods, and obtain new resources. Buildings are a resource that can house people, create opportunities for social organizing, and attract visitors and revenue. By building in the community's "missing teeth"--empty storefronts, large parking lots, streetfront gaps where floods have taken structures away—we can help reknit the town fabric and give the community a resource that can support their continuous efforts: a main street that the town can feel proud of.

This thesis uses a mixed-methodology approach, including literature and statistical review, morphological study, and firsthand ethnographic research.

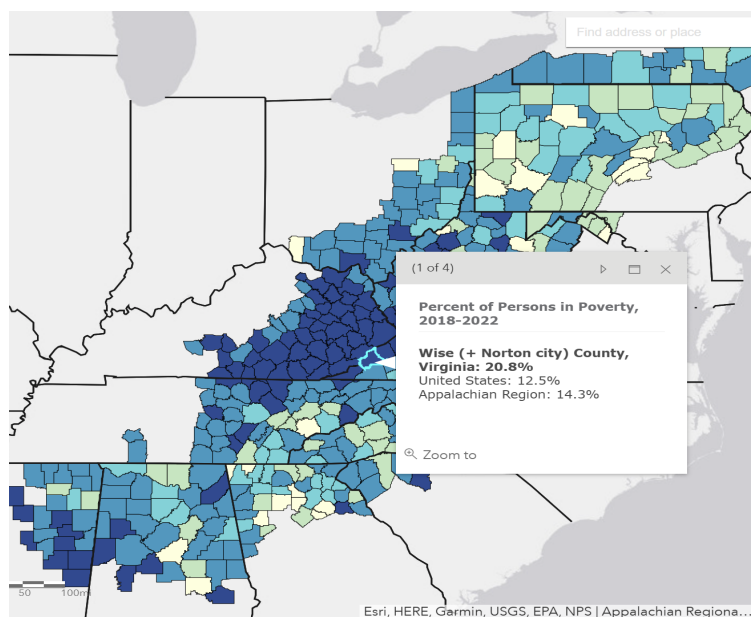


Fig. 1: Concentration of poverty rates 20% and above in eastern KY, Southwest VA, South WV, and Northern TN, the region known as central Appalachia.³

³ Income and poverty in Appalachia, July 2, 2024.

MISSING TEETH: The Holes in Our Communities

by

Hannah Elizabeth Gross

Thesis submitted to the Faculty of the Graduate School
of the University of Maryland, College Park, in
partial fulfillment of the requirements
for the degree of Master of
Architecture, 2025.

Advisory Committee:
Dr. Joseph Williams, Chair
Prof. Eric Jenkins
Prof. Adam Ainslie

© Copyright by
Hannah Elizabeth Gross
2025

Foreword: The Why

I thought I grew up in the suburbs, but I later realized the reason my childhood experiences didn't match that of the kids in *The Babysitters Club* was that we didn't have sidewalks. We were in the sub-rurals, which meant a lack of freedom of movement for a child. My school friends lived miles away and my dead-end street had a limited number of people my age. When I got my driver's license, it was a new level of freedom....except there was nowhere to hang out after school except the parking lot or getting snacks from Wawa, the nearest of which was a six mile drive.

At 14, I went on my first trip with Appalachia Service Project, an organization that does home repair in Central and Southern Appalachia. I was introduced to a region of the country with incredible scenery and a different overall level of socioeconomic status than where I grew up. That first year, I helped replace a floor and paint a bedroom for three elementary-aged girls, and while the work was a great learning experience, it is who it was for that I remember the most. The more years I returned, the more the region, the work, and the values became a formative experience.

ASP became a community for me in an age where people my age report feeling increasingly lonely. I built relationships with staff, homeowners, and other volunteers because we were brought together by our willingness to give help and accept help. Community is an integral part of the human experience; it gave us an advantage early in our evolutionary journey and is now etched into our DNA. And yet, American culture emphasizes hyperindividualism and measures success by our level of independence, starting with our childhood experiences with our built environment: disconnected suburbs, preference for cars over mass transit, and lack of public space separates us

from the people around us. Part of this thesis is about recognizing and grappling with a larger systemic urban and social problem, but part of it is undoubtedly unable to be disentangled from my own search for community.

I don't believe I alone can change the world with architecture. I'll never be a starchitect or a household name, but my experiences with ASP have shown me that I have the power to change someone's world and that I can help build the world I want to live in. This thesis intends to grow my skills in the direction I want my career to go: maybe not grand, but meaningful.

Acknowledgments

Thank you to my friends and family for cheering me on the entire way, especially my partner Harrison.

Table of Contents

ABSTRACT	i
MISSING TEETH: The Holes in Our Communities	iii
Foreword: The Why	ii
Acknowledgments	iv
Table of Contents	v
List of Figures	vii
Chapter 1: Introduction	1
Chapter 2: Literature Review	4
Section 1: The Holes In Our Communities	4
Section 2: Challenges in Appalachia	8
Subsection 1: Resources	10
Subsection 2: Environmental Stressors	11
Subsection 3: Depopulation	14
Section 3: Considering Solutions	16
Chapter 3: Methodologies	22
Chapter 4: Precedent Studies	26
Precedent 1: Postwar Munich, Germany	26
Precedent 2: Hangzhou, China	28
Precedent 3: Brooklyn Grange (Sunset Park Location), Brooklyn, NY	29
Precedent 4: 141-145 Curtain Road, Shoreditch, London, UK	31
Precedent 5: Frontier Restaurant, Albuquerque, NM	32
Precedent 6: Hazard, Kentucky	34
Chapter 5: Zones and Program	37
Section 1: Program zones	37
Section 2: Precedent Justification	40
Section 3: Reverse Engineering	41
Chapter 6: Site Selection and Analysis	43
Section 1: Site Selection Criteria	43
Section 2: Site Selection Process	44
Section 3: Town Site Selection	45
Section 4: Site Analysis	50
Subsection 1: Demographics	50
Subsection 2: History	50
Subsection 3: Environmental Hazards	51
Subsection 4: Transportation Corridors and Resources	55
Subsection 6: Missing Teeth	58
Section 5: Building Site Selection	59
Chapter 7: Discovery Phase and Conceptual Testing of the Thesis	61
Section 1: Urban Tectonics	62

Section 2: Building Tectonics	66
Section 3: New Precedents	66
Section 4: Conclusion	68
Chapter 8: Conclusion, Thesis Design Solution	69
Section 1: Urban Design	69
Section 2: The Hiking Hub	76
Section 3: The Library	79
Section 4: The Module	84
Section 5: Places	88
Section 6: Conclusion	92
Appendix A	96
Appendix B	97
Bibliography	98

List of Figures

Fig. 1: Concentration of poverty rates 20% and above in eastern KY, Southwest VA, South WV, and Northern TN, the region known as central Appalachia.

Fig. 2: Drawings by the West Philadelphia Landscape project, illustrating missing teeth in rowhouse blocks in 1997.

Fig. 3: Expanded instances of missing teeth to include short buildings and vacant buildings; diagram done by author. Base street elevation from the exhibition “Main Streets Resurfaced” by the Future of Small Cities Institute, enhanced with Krea.ai and additions made with Adobe Illustrator.

Fig. 4: Mountaintop removal mining site in West Virginia.

Fig. 5: Houses lifted off their foundations from devastating 2022 floods in Pilgrim’s Knob, Virginia.

Fig. 6: Author’s own photo of the hodgepodge of brick from the repair of the Pinakothek der Moderne museum in Munich.

Fig. 7: Diagram of plan for green alleys in Hangzhou, China.

Fig. 8: Brooklyn Grange, Sunset Park location, as seen from aerial side view.

Fig. 9: 141-145 Curtain Road as seen from street elevation.

Fig. 10: Interior of Frontier Restaurant’s front room.

Fig. 11: Downtown Hazard, Kentucky, in winter.

Fig. 12: Author’s own drawing, dubbed “Maslow’s Hierarchy” of Community Identity, demonstrating zones of program that should be in place to support community actualization.

Fig. 13: Brooklyn Grange Program Diagram, by Zambrano Architects.

Fig. 14: Site selection matrix, alongside population fluctuation data. Data shows that several towns are slowly decreasing, one is waffling, one is increasing, and several saw significant change in either direction from 2019 to 2020. Author’s own.

Fig. 15.1: Pound, VA aerial footprint. Population 844 in 2023. Google Earth 9/1/2023.

Fig. 15.2: Pound, VA street perspective looking NW. Google Earth.

Fig. 16.1: Princeton, WV aerial footprint. Population 5642 in 2023. Google Earth 10/5/2013.

Fig. 16.2: Princeton, WV street perspective looking NE. Google Earth.

Fig. 17.1: Rainelle, WV aerial footprint. Population 1159 in 2023. Google Earth 10/22/2022.

Fig. 17.2: Rainelle, WV, street perspective looking SW. Google Earth.

Fig. 18.1: Pennington Gap, VA aerial footprint. Population 1577 in 2023. Google Earth 4/13/2024.

Fig. 18.2: Pennington Gap, VA street perspective looking NE. Google Earth.

Fig. 19: Population trends in Pound, VA, from 1990 to 2023.

Fig. 20: Environmental hazards surrounding Pound, VA, including the Pound River, one active and one inactive surface mine within two miles of the town center, and one active surface mine within about four miles. Author's own.

Fig. 21: Storm system that traversed the east coast on 7/12/2022. When the front came through College Park at about 8 P.M. EST, my partner and I were out doing groceries and pulled a u-turn to try and out-drive the hail.

Fig. 22: house moved from its foundation in Whitewood, VA.

Fig. 23: flooding in Pound, July 2022, on Main Street looking West.

Fig. 24: floodplains in Pound. Pink is the 100-year floodplain, with a 1% chance of flooding per year. Purple is flood zone with a 26% chance of flooding over the course of a 30-year mortgage. Author's own.

Fig. 25: Major highways and access points to Pound. Author's own.

Fig. 26: Every establishment within a 2-mile radius of Pound, sorted by small businesses and social spaces. Author's own.

Fig. 27: Identified missing teeth in Pound: vacant lots, vacant buildings, buildings that are too short. Author's own.

Fig. 28: Potential sites: lots owned by the town are pink; private lots are orange. Author's own.

Fig. 29: Building site selection for development in Pound, VA. Author's own.

Fig. 30: Author's own. Conceptual drawing from early in the design process illustrating the different strategies applied to the north and south sides of the street.

Fig. 31: Author's own. Urban parti diagram showing the applied grid strategy, main street crossings, green spaces, habitable spaces (poche) and non-habitable spaces (hatch).

Fig. 32: Author's own. Diagram of the tectonic strategies in the urban and building designs.

Fig. 33: Author's own. Textural collage of the material choices for the design language.

Fig. 34: Author's own. Program diagram based on color to describe locations of space types.

Fig. 35: Google Maps images showing existing murals and location of future pocket park.

Fig. 36: Author's own. First image is a sketch drawn in fall 2023 that became a defining idea that desired more exploration, and second image is from the final design.

Fig. 37: Google Maps images of Green Jean's Food Hall in Albuquerque, New Mexico. The tectonics of this location were a visual influence on the final design.

Fig. 38: Author's own. Proposed urban parti juxtaposed with the existing figure ground.

Fig. 39: Author's own. Diagram of existing buildings, adaptively reused buildings, new "habitable" spaces and new "non-habitable" spaces.

Fig. 40: Author's own. Diagram describing tectonic strategies and grid kit of parts, showing dimensions and program suggestions for the grid-based parks.

Fig. 41: Author's own. Portion of urban plan illustrating the dissolving grid at either edge.

Fig. 42: Author's own. Program diagram organized by color.

Fig. 43: Author's own. "Places" diagram showing new notable spaces in the town.

Fig. 44: Author's own. Elements of the grid park "riverwalk system" as shown through sketches and vignettes. Vignettes taken from the historical society's new pavilion.

Fig. 45: Author's own. Vignette of the amphitheater space.

Fig. 46: Google Maps image of the existing town center from the north (Clintwood Hwy).

Fig. 47: Author's own. Collage photo of approach to the hiking hub.

Fig. 48: Author's own. Diagrams describing site strategy, promenade through different spaces, and structural strategy of the hiking hub.

Fig. 49: Author's own. Section perspective of hiking hub interior showing first floor nature center and second and third floor retail space.

Fig. 50: Author's own. Plans and structure diagram of the hiking hub.

Fig. 51: Google Maps image and author's own image of the existing conditions of "the old theater".

Fig. 52: Author's own. Street perspective of the library.

Fig. 53: Author's own. Plans and structure diagram of the library.

Fig. 54: Author's own. Front elevation and longitudinal section of the library.

Fig. 55: Author's own. Climate strategies diagram showing passive ventilation via the skylights and existing side door.

Fig. 56: Author's own. Transverse section illustrating light, materiality, and structural detail.

Fig. 57: Author's own. Axonometric drawings of modular housing units and concrete bases.

Fig. 58: Author's own. Front elevation and transverse section of the timber module and concrete base.

Fig. 59: Author's own. Plans, sections, elevations for the timber housing module, both sizes.

Fig. 60: Author's own. Structure diagram for the timber housing module.

Fig. 61: Author's own. Perspective collage of the Rescue Squad rec center tennis court.

Fig. 62: Author's own. Perspective collage of Granny Shores park.

Fig. 63: Author's own. Perspective collage of the Storytelling Park.

Fig. 64: Author's own. Perspective collage of the main shopping street corridor.

Fig. 65: Author's own. Phasing diagram shown through figure ground series.

Fig. 66: Author's own photos. Author visiting Natural Tunnel State Park and Pound, Virginia.

Chapter 1: Introduction

As discussed in the foreword, our environments play a role in how many opportunities we have for human connection, which then affects our personal and community wellbeing. Therefore, this thesis asks the question: how can selective infill of the "missing teeth" of a small town urban form better support and strengthen communities experiencing depopulation, minimal resources, and environmental stressors? The working theory is that infilling the missing teeth with resources the town identifies will not only help strengthen community pride, but also attract visitors and new residents to bolster the local economy. The project case study and design strategy focuses on Appalachia, but could not only provide an example for other towns in the region but be applicable to other regions, such as depopulation in the rust belt or mitigating gentrification-based displacement in rapidly growing urban areas.

In 2021 I did work with Appalachia Service Project near the capital city of Charleston, WV. It's small by most standards but by far the most urban place I've ever stayed in the region, which I and some other volunteers took advantage of one morning by getting coffee from a local shop a few blocks away. As we walked, I kept noticing storefronts that were boarded up and vacant, and how the presence of them made me feel uneasy. As it turns out, Charleston has been experiencing uneven redevelopment for several years, with the East Side receiving a post-COVID pedestrian restaurant street while the West Side's only grocery store remains a single antiquated Kroger. Also important to note is that the West Side has had a historically higher black population, while the East Side houses the civic buildings like the convention center and State Capitol complex.

This situation is not unique; towns all over the Appalachian region have been experiencing steady depopulation as coal, the resource that fueled the area's growth, has fallen out of favor, causing their main streets to decline. Many towns are an interesting mix of extremely rural context with a downtown area that feels distinctly urban: a block structure, defined street edge, "rowhouse" style buildings. Many are also located in the floodplain of a river, the only flat place to build a street grid in the contextual topography, meaning they are prone to flooding. It is already difficult to import resources like food and necessities to remote areas, and hurricane Helene in September 2024 showed that this is vastly compounded if the only existing roads are taken out by flooding.

Flooding can also be a reason for urban decay in small Appalachian towns, as often buildings are damaged in a way that causes tenants to vacate or even the structure to be torn down. "Missing teeth" is a term to describe the phenomena of a noticeable gap in a street where a building used to be.⁴ This thesis expands on this to include empty storefronts, building height discrepancies, and unreasonably large parking lots as "missing teeth", as they also affect the street experience by insinuating something is missing.

Despite the area challenges, residents of Appalachia have a strong place attachment to where they live. Some people have lived their entire lives in their hometown, the surrounding mountain peaks like familiar friends. Many of them are proud of where they live, and continually work against urban decay—like in the case of

⁴ "Missing Teeth." West Philadelphia Landscape Project, September 28, 1997.

Pound, Virginia, where the town regained its charter after administrative and infrastructural problems caused the state to threaten its removal.⁵

Another big takeaway from working with Appalachia Service project is their emphasis on sensitivity to residents' needs. I was taught to say things like "remove and replace" a floor instead of "rip out" or "demolish," since working in someone's home already causes stress by disruption of the norm. Because of this, it was extremely important to me to be able to get in contact with a community to obtain consent for researching and designing in their town. Often architects forget that "unimportant" or "ugly" buildings may have incredible meaning and history to someone. It's important to me to remain sensitive to people's needs for the duration of my career and treat them with dignity and respect, for there is no project without the people.

⁵ Schneider, Gregory S. Town of pound emerges from its death sentence in VA. General Assembly

Chapter 2: Literature Review

The literature review aims to help define what missing teeth are and the effects they have on people, as well as go over the specific challenges facing the Appalachian region and how an architectural strategy focusing on missing teeth can help improve them.

Section 1: The Holes In Our Communities

“Missing Teeth” is a term that has seen use in architectural contexts beginning approximately in 1997, when the West Philadelphia Landscape Plan project conducted at the University of Pennsylvania defined them as “a vacant lot or group of adjacent lots within a block that creates a gap between houses.”⁶ The project noted they were “particularly noticeable in blocks of rowhouses” and suggested they could be infilled by things such as a pocket park, playground, flood control lot, outdoor workspace, or a new building, but that some effort to fill the gap would improve the appearance of the street. “Missing teeth” as a term also appears in a series of podcasts by James Howard Kunstler in 2008-2009, beginning to include parking lots and vacant lots as another typology.⁷

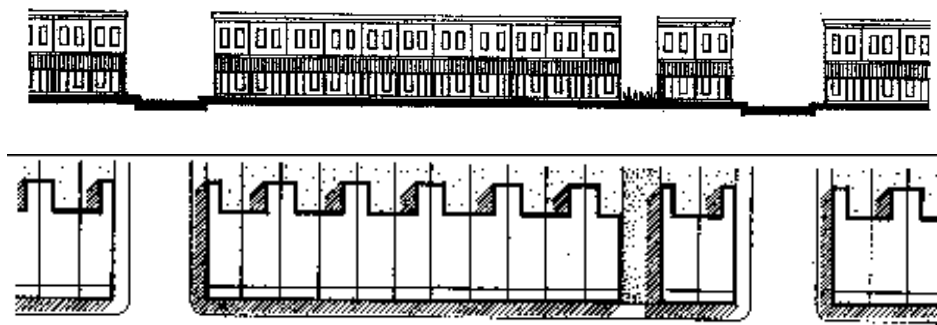


Fig. 2: Drawings by the West Philadelphia Landscape project, illustrating missing teeth in rowhouse blocks in 1997.

⁶ “Missing Teeth.” West Philadelphia Landscape Project, September 28, 1997.

⁷ Cray, Duncan. *The KunstlerCast : Conversations with James Howard Kunstler*.

This thesis proposes to expand the definition of missing teeth further to include buildings in a street front that are much shorter than their surrounding context, because they break the consistency of the street, making the pedestrian feel less enclosed. It also discusses empty storefronts as missing teeth since they also contribute to a sense of disinvestment. In addition to these types of physical missing teeth, the term can be extrapolated further to describe non-physical gaps, such as those left by people in a community who had to leave, or a lack of community identity in the first place.



Fig. 3: Expanded instances of missing teeth to include short buildings and vacant buildings; diagram done by author. Base street elevation from the exhibition “Main Streets Resurfaced” by the Future of Small Cities Institute, enhanced with Krea.ai and additions made with Adobe Illustrator.

The economic and psychological impact of physical missing teeth on a community at large is still understudied, but there is emerging research that connects the presence of them to lower property values. However, the “broken window theory” from criminology espouses similar ideas and can be used to partially explain the effects of physical missing teeth. The theory comes from a 1982 book by Wilson and Kelling and postulates that unrepaired broken windows send “a signal to those who pass by every day...that the owner of the bundling isn’t paying attention or doesn’t care.”⁸ If the owner and city don’t care about small crimes, then larger crimes must also go unpunished, causing community members to feel unsafe and withdraw from their

⁸ Levine, M. *Broken Windows, Broken Business: The Revolutionary Broken Windows Theory: How the Smallest Remedies Reap the Biggest Rewards.*

community, which then allows more crime to happen because “no one is watching.” (Levine) This theory was actually put to the test in 1994 when New York City mayor Rudolph Giuliani decided to crack down on minor infractions like subway fare evasion and graffiti in an effort to send a zero-tolerance message—eventually resulting in a much lower rate of serious crimes and giving us the New York Experience we know today.⁹

Physical missing teeth in a main street are like the broken windows of a city: they symbolize that the people in charge care little for its image and experience, and therefore makes the city less attractive to visitors and investors alike, because if the city looks like this there must be underlying problems. Vacant lots in particular can contribute to the pedestrian perception of being unsafe, where “People will cross the street rather than continue walking on the side where the empty space is.”¹⁰ There is also established research that darkness and lack of ambient noise cause humans fear by leading us to anticipate threat, since light and sound let us know who or what is around us,¹¹ and a vacant lot is often both shadowed and silent. Feelings of unsafety are likely to negatively affect the economics of an area, with less people willing to live and shop there, so a feeling of safety is more likely to bring positive value.¹² Ergo, repairing physical missing teeth in a city street via adaptive reuse and ‘surgical’ infill projects can repair the perception of the city.

Non-physical missing teeth are less researched but still play a role in our day to day experiences. Examples of non-physical missing teeth are a lack of community

⁹ Levine, M. *Broken Windows, Broken Business: The Revolutionary Broken Windows Theory: How the Smallest Remedies Reap the Biggest Rewards*.

¹⁰ Crary, Duncan. *The KunstlerCast : Conversations with James Howard Kunstler*.

¹¹ “‘Sound and Safe’: The Effect of Ambient Sound on the Perceived Safety of Public Spaces.”

¹² *ibid.*

identity or the holes left behind by neighbors and community members who have moved away. This happens particularly in actively gentrifying areas where residents are forced out as the cost of living quickly exceeds their financial capabilities. Another reason may be due to a disaster compromising the integrity of their living situation. Without people, there is no collective community that we as humans benefit so much from, and this is particularly pressing in an age that the U.S. Surgeon General terms a “loneliness epidemic.”¹³ According to a poll of 2200 adults by the American Psychological Association in January 2024, young adults aged 18-34 were the loneliest generation: 30% said they were “lonely every day or several times per week.”¹⁴ 50% of all adults said they find a distraction like TV or social media when they feel lonely, which does not solve the problem. The poll also said that while most adults saw social media as useful to form new relationships and maintain existing ones, the votes were almost evenly split as to whether those relationships were “meaningful” or “superficial”.¹⁵ Essentially, keeping communities together is more important than ever. The antithesis of loneliness is community.

One architectural concept that is highly supportive of community creation is the third space, the place people go when they are not at home or at work. They come in many forms: bars, coffee shops, bookstores, hair salons, parks, general stores, cafes, restaurants and everything in between, but are mainly spaces that have some inherent social element. In Ray Oldenburg’s book *The Great Good Place*, he defines third spaces as having some combination of eight characteristics: politically-neutral ground,

¹³ Murthy, Vivek Hallegere. *Together : The Healing Power of Human Connection in a Sometimes Lonely World*.

¹⁴ “New APA Poll: One in Three Americans Feels Lonely Every Week.”

¹⁵ *ibid*.

unpretentious atmosphere, accessibility, a playful mood, regular inhabitants, a sense of ownership, conversation as main activity, and a social leveler—people of all classes can be found there.¹⁶ These are places that are often considered “the heart of a community”,¹⁷ and are often where grassroots activism or community organizing happens. While architecture cannot forcibly determine the end use of a space, it is important to design in a way that encourages third spaces to form. These would be excellent if used in conjunction with the strategy of infilling missing teeth, since the process would reinstate resources with less risk of harming a community by removing resources the way the typical ‘raze and redevelop’ process goes.

These issues—missing teeth, gentrification, loneliness, lack of third spaces—are found in cities all across the United States, but particularly in places most affected by deindustrialization and outsourcing of production jobs, such as the Rust Belt and Appalachia. This thesis focuses on Appalachia specifically since it is much easier to design spaces for a community that is already there than to design a space and expect people to come to it.

Section 2: Challenges in Appalachia

As previously mentioned, the main challenges facing Appalachian towns in addition to missing teeth are depopulation, lack of resources, and environmental stressors. These are all intertwined and in some way can be traced back to the coal industry, which was a large reason people moved to the region in the first place. Since

¹⁶ Oldenburg, Ray. *The Great Good Place : Cafés, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*.

¹⁷ *ibid.*

there was no established transit, sanitation, retail, or housing infrastructure, coal companies had to build it all—railroads, homes, stores, churches, sewers. These “company towns” owned everything, sometimes even paying workers in “company credit” they could only spend at the company store, effectively keeping them from moving away from the company and extracting their labor and wealth from them. Even after the company town model fell out of favor, many families kept their mining jobs and passed their position down to their children. As environmentalism pushed for cleaner energy sources, the coal industry began to lay off workers and people whose entire livelihoods were based on that industry income were suddenly left without it and began to move out. The coal industry is also extractive in the literal sense that it pulls natural resources out of the Appalachian Mountains to be shipped away to other parts of the country without investing much back into Appalachian communities. The act of this extraction on a large scale is also a contributor to environmental problems like deforestation and flooding. A staff member working with the organization Grow Appalachia sums it up this way:

“Appalachia is a deeply unique place...it has been an isolated region that has been overlooked and then used and stereotyped and unvalued and underserved. Had it been that the resources that were generated from coal and from timber extraction had actually stayed and benefited the region, that would be a different story, but it hasn't. Where's that money gone? You don't drive through the region and see it. You see devastation, you see toppled mountains, you see broken homes, you see broken down cars, and kids who don't have access to good education and healthy food.”¹⁸

I really can't put it better than someone who lives and works in the region itself.

¹⁸ Engle, Elyzabeth W. “Coal Is in Our Food, Coal Is in Our Blood’: Everyday Environmental Injustices of Rural Community Gardening in Central Appalachia.”

Subsection 1: Resources

As the coal companies found, it can be difficult to get resources in and out of the Appalachian mountains. The topography is often too steep to build straight roads and sometimes the only way in and out of an area is through a gap in the ridges. The difficulty of access means that it's often not worth the transportation efforts for companies to put a location in an area with low population. Stores like Walmart and Dollar General capitalize on this by specifically targeting these areas, but dollar stores especially have been criticized for undercutting small neighborhood grocery stores, eventually forcing them out and “reducing access to produce and other perishable food items for low-income residents, creating ‘food deserts.’”¹⁹ They are also similar to the company towns in that they are termed “extractive development,” which is a type of business that funnels money out of a community instead of the money remaining in it, contributing to generational poverty.²⁰ If a consumer spends \$20 at a local grocery store, the grocer might use it for a haircut, the barber might use it to buy breakfast at the coffee shop, and so on. The original \$20 has now generated \$60 of value in the community. If a consumer spent that money at Dollar General because it seemed cheaper, that \$20 goes into the Dollar General company pockets and is never seen again.

Both the lack of resources and the heavy reliance on what is left is highly evident in a 1994 paper by Susan Keefe recounting discourse surrounding a highway expansion project on the outskirts of a town by the pseudonym “Long View”.²¹ While many low-

¹⁹ Caoui, El Hadi, Brett Hollenbeck, and Matthew Osborne.

²⁰ Carter, Majora. *Reclaiming Your Community: You Don't Have to Move out of Your Neighborhood to Live in a Better One*.

²¹ Keefe, Susan Emley. “Urbanism Reconsidered: A Southern Appalachian Perspective.”

income communities in other parts of the U.S. might heavily protest the imposition of a four-lane highway in their area, the acceptance of the development in this case study is quite telling. Keefe describes how vacationers who resided there in summer were vehemently opposed to the highway ruining their “quiet, picturesque town”,²² while year-round residents insisted it go through. They describe how the town used to have primarily small businesses and raised their own meat and vegetables before outsiders moved in and insisted that the gardens, animals, and outhouses were an eyesore. Over time, what was originally a self-sufficient community came to rely on money from tourists and food and goods that were shipped in: “Do all these people who...don’t want a truck route, realize that almost every bite that we eat or drink and the clothing we wear comes into our county on trucks?”²³

Subsection 2: Environmental Stressors

The history of mining operations in Appalachia not only set the stage for the area’s economic fall from grace, but they are notorious for contributing to regional environmental stressors. Techniques have evolved over the years alongside the human capability to produce massive machinery, and one of the most dramatic and ugly forms of this is strip mining or mountaintop removal mining, which can completely change the character of a landscape that took a billion years to form in a comparatively miniscule amount of time. Large scale mining operations are known to cause water contamination, air pollution, and noise pollution. There are areas where a thin film of coal dust over everything is the norm, and this constant exposure to pollutants mean that “the coal

²² Keefe, Susan Emley.

²³ *ibid.*

mining-dependent areas of Central Appalachia endure higher rates of mortality, birth defects, cancer, and acute and chronic illnesses” than non-mining areas of the country.²⁴ These health issues not only limit residents’ daily activities but their ability to engage in community organizations, of which there are many that actively protest the misdeeds of mining.



Fig. 4: Mountaintop removal mining site in West Virginia.²⁵

The vast coverage of pollution that mining creates also limits “the availability of safe, flat, and fertile land for food production,”²⁶ Mountaintop removal sites take away large amounts of topsoil, can spread pollutants to areas outside their limits, and even after they are abandoned remain unsuitable for crop growth despite being a large area of treeless land.²⁷ This as well as personal health struggles limit the ability of people to participate in the production of food, a self-sustainable activity that is a large part of

²⁴ Engle, Elyzabeth W.

²⁵ Ellingvag, Orjan F. *A mountaintop removal coal mine in West Virginia*.

²⁶ Engle, Elyzabeth W.

²⁷ *ibid.*

Appalachian history and culture and arguably a path to helping the region produce more resources for itself. For people with a deep connection to land and Place, mountaintop removal mining is a multifaceted wound and potentially the biggest missing tooth of all.

Another side effect of large scale mining is its contribution to flooding due to the side effect of deforestation. Rainwater running down the side of a mountain moves more quickly over compacted, treeless soil, increasing to destructive speeds.²⁸ This is not helped by the low resources of residents; despite many towns being built on the flat floodplains at the bottom of the mountain, many homeowners do not opt to purchase flood insurance since it is separate from homeowner's insurance and of high cost—in eastern Kentucky where the median income is only \$37,263 per year, flood insurance costs \$1,384 or around 7% of the annual income.²⁹ A recent freak storm in July 2022 caused massive flooding in 13 Kentucky counties, but only 5% of damaged homes were found to have flood insurance.³⁰ It is often the case that the cost of rebuilding in a floodplain and insuring the new building is prohibitive, so many missing teeth created by flood disasters often remain that way. Even with insurance, if someone opts to rebuild on the same lot there is high likelihood that the situation will repeat itself. The aforementioned counties have experienced a federally declared flooding disaster once every 1-3 years since 1967, while the rest of the state experiences this once every 5+ years.³¹

²⁸ Klesta, Matt. "Resilience and Recovery: Insights from the July 2022 Eastern Kentucky Flood."

²⁹ *ibid.*

³⁰ *ibid.*

³¹ *ibid.*



Fig. 5: Houses lifted off their foundations from devastating 2022 floods in Pilgrim's Knob, Virginia.³²

Subsection 3: Depopulation

Understandably, many people who lose their home from flooding choose to move away from the area if they are financially able. “Research finds that natural disasters such as floods increase the overall number of migrants who move...from the impacted area, which in turn impacts the local labor force.”³³ This is one of the biggest non-physical missing teeth: depopulation. The truth is, people are also resources; they provide labor—both physical and emotional—to other people such as construction and repair trades, selling food and goods, and caring for people with disabilities or health problems which we’ve established is a great need. Even social relationships and having

³² 3 people not yet located after flooding in Buchanan County, Va. - The Washington Post.

³³ Klesta, Matt.

someone to talk to is an important job; studies show that supportive relationships help insulate people from the effects of life stressors,³⁴ so the lack of such services and relationships is very clearly felt. Since 1996, data from eastern Kentucky shows an average population decline of about 2,000 people per year from the region.³⁵ This can be cross-referenced with employment data in mining: from 2006 to 2022, eastern Kentucky specifically lost 77% of its positions in the natural resource and mining industries, or 9,544 jobs.³⁶ It's a feedback loop: people move away, which removes resources and forces companies holding jobs to close, which pushes people away, which further removes resources and so on. This is particularly evident in the wake of flooding: the construction industry becomes overwhelmed with need and families in need may need to wait a long time before repairs can be completed.

There is also a specific type of person that is fleeing Appalachia at a disproportionate rate: young people. Developer Majora Carter talks in her book *Reclaiming Your Community* about how in low-income communities young people are encouraged to measure their own success by how far away they can get from their hometown. The best and brightest often move away to college instead of investing back into their community, because they're told they will do better elsewhere. This can be incredibly damaging because "talented, visionary people are also a resource." They start businesses, they fight for policy, they provide an example of success and "teach the next generation... what is possible."³⁷

³⁴ "Understanding the Long-Term Effects of Public Open Space on Older Adults' Functional Ability and Mental Health."

³⁵ Klesta, Matt.

³⁶ *ibid.*

³⁷ Carter, Majora. *Reclaiming Your Community: You Don't Have to Move out of Your Neighborhood to Live in a Better One.*

I am reminded of working on a home in Bland County, Virginia, where sudden rain forced us to take an early lunch. Half our team had been hanging drywall indoors while the other half finished a wheelchair ramp for an older gentleman with limited mobility, who lived alone other than help from his son and daughter-in-law. My dad and I sat on the porch watching the rain and talking to the daughter about life. She was in her mid 20's and at the time worked as a pharmacy tech but wanted to go back to school to eventually become a pharmacist, but doing so would mean she wouldn't be able to care for her disabled father-in-law. Many people had encouraged her to go, following the narrative of needing to leave to find success, but it was clearly a difficult decision: should she choose a stable path for her future, or continue to care for her loved ones? It's been seven years since that conversation and I often wonder what she chose.

But what if she hadn't been forced to pick? What if there was a way to repair the resource gaps and make places where people had the resources to support their lives, were safe from flooding, and young people were proud to be from? This is why solving both the physical and non-physical missing teeth is so important, and why architecture is uniquely suited to help solve them.

Section 3: Considering Solutions

With all of these reasons for struggle, it could be easy to view Central Appalachia simply as poor and a place nobody would want to live. But that narrative is hardly the entire story, as their history of isolation and disinvestment by large industries makes Appalachian communities partially characterized by an attitude of communal self-reliance. They garden despite the risks of pollutants and are willing and ready to help

their neighbors and nearby towns when floodwaters rise. Many of those who grew up there want to see the place they live return to being a lively downtown, and are already there working to create the resources to do it.

Architecture is a resource. Whatever form the missing teeth come in—vacant lot, empty storefront, short facade in the streetfront—there is an architectural solution, whether it is a new building, tenant fit-out, or adaptive reuse by vertical addition. The key is specifically targeting the already missing teeth so as not to remove any more resources by removing an existing building, a move I have termed “surgical urban planning”.

Adding architectural resources can help address lack of jobs, housing, and access to healthy food. Buildings designed for small businesses could fill some missing teeth and activate the street. Small apartments could be created as permanent or temporary affordable housing to be able to absorb housing fluctuations in disaster scenarios. Designing a specific typology that amplifies the history of and assists Appalachian gardeners, such as an urban farm or garden center hub, could not only help mitigate the environmental issues of soil contamination by growing food in raised beds or hydroponics, but also physically creates more resources. The building would need employees so would create jobs, and would also produce food that could be used in local restaurants or sold elsewhere.

Infilling missing teeth not only strengthens the self-reliance of a town, but also has the potential to pull in outside resources such as a larger industry and tourism. Hazard, Kentucky, is a town that has been putting a lot of effort into revitalizing their main street revitalization the last few years. Their mayor explains the effects in that “If

Hazard were to recruit a bigger industry, prospective companies will want to check out what downtown is like...if your downtown has nothing but boarded up windows and there's no life, the possibility that you getting that company is not good."³⁸ The same goes for tourism money; people visit and spend money in places that look nice and feel safe. During the pandemic we saw an increase in people doing activities in nature, and the population of many Appalachian towns saw a slight increase in residents. To continue attracting tourists, many towns capitalize on their rich history and beautiful natural context, so another typology that could compel tourists to stop is an environmental tourism center with hiking supplies and information, or a storytelling center that showcases area history and stories from residents to keep their traditions alive.

Because many towns are located in flood prone areas, any new architectural installments need to be able to weather the waters. Buildings can be raised above projected flood levels, important equipment moved upstairs to prevent damage, and the envelope be waterproofed to a certain height.³⁹ Adaptive reuse is another desirable strategy for dealing with floods and allows for preservation of historic structures. Due to the costs of construction and insurance for a new building in a floodplain, sometimes re-using an existing building—even if it's in poor condition—would be easier. Some of the same floodproofing solutions as new buildings could be retrofitted to decrease damage potential. If an existing building is short compared to its neighbor, adding additional structure and building on top can be a creative solution to fill a visual missing tooth and add resources back to the street. Some flood mitigation strategies that can apply to the

³⁸ Mueller, Caroline. "Downtown Hazard Sees Growth as Several Businesses Expand."

³⁹ "Flood Protection and Prevention - - Tips and Solution." firststreet.org.

town as a whole include levees, dikes, dams, and reducing impervious surfaces—creating wetlands, rain gardens, bioswales, to improve stormwater drainage can help floods recede faster.⁴⁰

The health effects many regional people experience from exposure to the mining industry are unable to be solved through architecture, but research shows that having walkable access to green spaces and social spaces help maintain good mental and physical health. A study by Dr. Julianne Holt-Lunstad found in 2009 that “people with strong social relationships are 50% less likely to die prematurely than people with weak social relationships.”⁴¹ Creating “good quality” public spaces includes accessibility: limiting steep slopes and stairs, including benches and shade, and various types of leisure activities such as chess areas, walking trails, ping pong tables, and playgrounds.⁴² Making sure a main street has accessible sidewalks and curb cuts are also important for disabled and aging residents to be able to access vital activities.

Depopulation as non-physical missing teeth is another difficult and multifaceted problem adjacent to architecture. There are two parts to solving it: retaining existing residents and recruiting new ones, where both groups could benefit from a positive perception of a town’s economic vitality and community identity. A good way to help strengthen community is to design for third spaces. Environmental psychology teaches us that while the spaces we create do not determine their end use, they can influence it. Buildings or outdoor areas that include multiple sizes and types of space at appropriate

⁴⁰ “Flood Protection and Prevention - - Tips and Solution.” firststreet.org.

⁴¹ Murthy, Vivek Hallegere. *Together : The Healing Power of Human Connection in a Sometimes Lonely World*.

⁴² “Understanding the Long-Term Effects of Public Open Space on Older Adults’ Functional Ability and Mental Health.”

sizes, both private and communal, give people options to use depending on their personal space needs to allow comfort. Configurations such as circular or “sociopetal” seating are ideal for group or community gathering. Creating architecture that houses strong third spaces and therefore regular patrons can make newcomers feel welcomed and valued, while people who grew up there develop a strong attachment to the place.

With the low property values and focus on attracting new residents, it could be argued that Appalachia is in danger of gentrification and further displacement-based depopulation. Gentrification typically starts with the acquisition of cheap land that is then developed into something expensive, but the risk in Appalachia is minimal compared to more urban contexts since land is not as limited as it is in larger cities. Typically it is a lack of housing that causes a supply constriction and therefore an increase in property prices, but anticipating need for housing by planning it into revitalization efforts in the first place can help keep prices reasonable. Also, the way developers are able to acquire land in urban areas cheaply in the first place is if the residents of a community have little belief in its value, therefore deciding to sell their land at a price lower than it is worth. In some Appalachian communities the opposite is true, where residents value their land more than it is appraised for by outsiders due to its rural nature and physical decline of the context, and they refuse to sell at the proposed price. While depopulation is certainly an issue, many residents’ strong ties to their land and each other prevent them from being victims of gentrification.

Even with the challenges, Appalachia is an excellent region to explore the effects of rectifying the missing teeth of an urban fabric because of the history of the area, current lack of resources, and above all, the people who live there. As one resident of

Hazard, Kentucky puts it: “The community rallies around our small businesses and small businesses rally after each other to help...grow and expand. They understand that rising tides raise all boats. They are the rising tides.”⁴³

They care, and that is reason enough to care as well.

⁴³ Fugate, Ariel. “From Boarded Up to Bustling: Another Hazard, KY Building Renovated.”

Chapter 3: Methodologies

This section discusses the methodologies proposed for the thesis and how they are to be used. This project is accomplished by using a mixed-methodology approach, including multiple qualitative methods including literature and statistical review, morphological study, and firsthand ethnographic research.

First, the problem is defined through a combination of personal interest and statistical analysis. Data collection on population trends, poverty rates, and flooding helped to narrow the area of greatest need to Central Appalachia. Knowledge of the problem was expanded through conducting literature review and informal conversation with various contacts to determine what issues are specific to Appalachia and what architectural strategies can help.

Data collection is important, but on its own is not enough to understand the whole picture. Ethnographic research “emphasizes in-depth engagement with site-specific settings, most especially through active and thorough observation”.⁴⁴ This project relies heavily on ethnography due to its site-specific nature; each community has unique histories and problems that play a role in shaping the project. It was important to me to actually talk to a community organization in order to obtain consent for centering a project on their town. It treats them more like people than something to be studied, a statistic. The research was conducted primarily through interviews done via phone, video call, and in-person conversation.

The process to the interviews was thus: first I tapped my network for people who have worked in the target area and obtained their recommendations for a town that has

⁴⁴ Lucas, Ray. *Research Methods for Architecture*.

a missing teeth condition and would be willing to collaborate. Email was utilized to connect to contacts they recommended. Community organizations such as historical societies, city councils, and other independent organizations were also contacted directly. Based on conversations along the way as the problem was further elucidated, a standard set of interview questions were developed (Appendix B) so that each town interviewed could be accurately compared. The results of all interviews, statistics, and reviewed literature were compared in a site selection matrix to decide the optimal choice. Site selection for this project contained two levels of detail: selection of a town and selection of building site.

Precedent research happened simultaneously throughout the initial networking. Multiple people suggested talking to members of Hazard, Kentucky due to their ongoing success at downtown revitalization, so it became a case study. Other precedents were researched through sourcing documentation through drawings and writing, creation of analytical diagrams to further one's knowledge and the overall industry understanding of the case, and a final written analysis.

Site analysis was conducted in two levels: analysis of towns and analysis of building sites. The criteria for deciding the town site included that it be in central/southern Appalachia, have an urban form containing a main street and missing teeth, have a contactable community organization, a history of flooding, and was close enough to visit—within a day's drive. Exploration of towns via google maps documentation and diagramming through figure-ground helped to determine whether the urban form criteria was met. The decision of the building site was done through

more in-depth diagramming of the town's morphology and building uses and a follow-up interview to glean community knowledge and opinions.

This thesis process intends to be an introduction to the world of community participatory design, a process that involves “community residents as an active partner in defining and structuring research engagements.”⁴⁵ It is recognized that doing this invites more organizational difficulties, so the idea of contacting a community organization instead of individuals was in order to limit the complexity and scope due to the quick timeline of the project. Participatory design often involves brainstorming and doing design workshops with a community, since they are the experts on their own lives and history and it is not the author's place to assume their experiences. Since this is a master's thesis, it is mainly academic constraints that shape the project, so community check-ins consist more of a “presentation-feedback” format than a true sandbox-style workshop. It remains important to the author to include actual Appalachian voices in order to create a sensitive design solution.

The proposed schedule to the community was an initial interview in November or December of 2024 with perhaps a follow up to discuss building sites, a progress check-in in February or March of 2025, and a final presentation in May 2025. A visit to the town was also proposed to fill in any information gaps and round out the author's embodied knowledge. The final testing of the thesis is to be done through feedback from the community and professionals alike. On completion, the community is allowed

⁴⁵ Harrington, Christina, Sheena Erete, and Anne Marie Piper. “Deconstructing Community-Based Collaborative Design: Towards More Equitable Participatory Design Engagements.”

to utilize any of the materials produced with credit in order to help reach their goals for their town as a thank you for providing insight to the project..

Overall, the types of research this thesis employs mainly fall under ethnographic and qualitative means. Ethnography and its human-focused lens is particularly important when doing a project that is human-focused. One other aspect of qualitative research is the ability to utilize a personal or informal writing stance; a “literary, flexible style that conveys stories.”⁴⁶It is frustrating to me when articles that intend to disseminate knowledge utilize too much mystification, making the knowledge inaccessible for many. I would prefer to write something I enjoy reading. For thousands of years, humans have told stories, and we should not discount the power of stories as a conveyance of information.

⁴⁶ Lucas, Ray. *Research Methods for Architecture*.

Chapter 4: Precedent Studies

The study of precedents is important because originality is a farce. Instead of trying to work from scratch, a project might be more successful if it builds on societal collective knowledge—just as how a literature review builds on the contributions of multiple people to an academic field. For this the author studied a range of five precedents over multiple scales: city, neighborhood, block, building, and interior space. Each precedent also had a specific aim. The first looks at historical response to filling urban missing teeth, the second looks at green space interventions, the third an urban farm typology, the fourth adaptive reuse, and the fifth a good example of a third space.

Precedent 1: Postwar Munich, Germany

Munich was heavily bombed during WWII, and as a result was faced with a lot of missing teeth. The city ultimately decided to rebuild its historical center instead of building modern buildings in its place, and also took the opportunity to put in a ring road that loosely paralleled the city's long-gone medieval walls, even though it meant removing more buildings. One thing worth learning from is how intensely they documented and categorized damages before proceeding. As noted by Elzanowski and Enss in "Cartographies of Catastrophe", "unmapped buildings ceased to exist." If there was no record of something, it was easier to get rid of it for the sake of progress. Another thing worth noting was Munich's innovative--but necessary--reuse of found material during reconstruction. Builders and citizens just picked up whatever brick they found and used it to patch buildings, regardless of whether it matched. The result is

analogous to the striking Japanese technique of kintsugi, where the scars of something broken are made beautiful during repair and take on new life.

What I learned from it: Munich utilized active community participation in its rebuilding. Residents themselves helped to decide what went where and physically came together to rebuild destroyed buildings and forge a new identity of Munich. However, city planners didn't always constrain themselves to what people wanted; they saw the widespread damage as an opportunity to make the city into their vision. In the case of the ring road, some structures that could have been rebuilt were instead fully demolished.



Fig. 6: Author's own photo of the hodgepodge of brick from the repair of the Pinakothek der Moderne museum in Munich.

Precedent 2: Hangzhou, China

Hangzhou is a city famous for its balance of greenery and the built environment. China's rapid industrialization has also created a high concentration of air pollution, and the planners in Hangzhou decided the solution was to plant trees in as many neglected pockets as possible in organized fashion. These small scale interventions have added up to create a city where greenery nearly replaces concrete as the default neutral material, as seen in green alleys, plazas, and the trees lining every street and canal. While it has notably improved the urban heat island effect, flooding, and wind speed, it is important to note that this alone does not solve the pollution problem. Also, greening a space can lead to gentrification; as public health and beauty improves, more people are drawn to an area and housing costs rise. As stated by Wolch, Burne, and Newell, this can cause an environmental justice paradox where poorer residents who are most in need of the benefits of green space are forced away from it. To combat this, developing enough housing, minding community needs, and spreading green space equally throughout must be considered.

What I learned from it: Hangzhou's planners were steadfast in their commitment to creating a more liveable city. They actively pushed policy to implement greenery not just to help lower the pollution levels and city temperature, but because of the public health effects; people who live in closer proximity to green space have more stable mental and physical health, and is therefore a necessary inclusion in any urban project. The city's current condition is helped by that the urban structure of Hangzhou is primarily apartment and taller office buildings that vertically densify the population and

leave plenty of ground space for greenery to put down roots. The result from satellite imagery is a city that appears equal parts built and equal parts green.



Fig. 7: Diagram of plan for green alleys in Hangzhou, China.⁴⁷

Precedent 3: Brooklyn Grange (Sunset Park Location), Brooklyn, NY

Brooklyn Grange is an urban rooftop farm on an adaptively reused warehouse, designed by Zambrano Architectural Design. “Brooklyn Grange” is also the name of an organization operating multiple urban farms in the NYC area, on top of restaurants, in backyards, and on convention centers. One of their locations houses a nonprofit working with people with developmental disabilities and sell hot sauce. The “Sunset Park” location is 2.5 acres and features an intensive green roof. The warehouse building’s heavy reinforced concrete structure is able to take the new roof dead load without alteration or complaint. It includes a greenhouse for plants, a 2700 SF indoor events space, and a gazebo space as well as plenty of outdoor area for walking and

⁴⁷ Wolch, Jennifer R., Jason Byrne, and Joshua P. Newell. “Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities ‘Just Green Enough.’”

playing.⁴⁸ There is elevator access, gender-neutral restrooms, and an onsite bar that serves beverages made with materials from the farm and “aims to send no waste to landfills”.⁴⁹

What I learned from it: The program of an urban farm could be a good solution to a specific niche of problems facing a low income urban community. It produces resources for the community, creates jobs, and provides a social hub for both free and paid events. In Brooklyn’s case, it also fits the area’s industrial aesthetic. However, depending on how it is to be done, it could require an intensive green roof which needs a substantial structure and depth to support it. The type of existing building that has this trait without amendment is rare, but not impossible to find.



Fig. 8: Brooklyn Grange, Sunset Park location, as seen from aerial side view.⁵⁰

⁴⁸ “Brooklyn Grange.” ZAD . Zambrano Architectural Design.

⁴⁹ Alexa, Alexandra. *Brooklyn Grange Sunset Park*, courtesy of Brooklyn Grange.

⁵⁰ *Ibid.*

Precedent 4: 141-145 Curtain Road, Shoreditch, London, UK

This office building was designed by Duggan Morris after the planning commission placed the restriction that the facade must be maintained to preserve the historical neighborhood character. Through the use of a vertical addition, the client's usable space "nearly doubled." The structure is steel frame and was concluded by Barton Engineers to be able to support the additional, lightweight wood joist floors. The masonry party walls were built up for better support, and steel ties incorporated to upgrade it to modern building standards. The interiors were also renovated and the entire project cost \$3.3 million.⁵¹ In my opinion, the design itself does provide continuity at the street level, but it adds a touch of sleek modernism in the new upper stories that provides additional interest to the neighborhood. The coloring blends in well; it's the texture that accomplishes this. The aluminum screens are 40% transparent to allow light into the spaces but maintain privacy. Overall, it's a testament to mixing historic preservation mandates with modern uses in an attractive result.

What I learned from it: I thought vertical addition was somewhat of an up-and-coming trend of adaptive reuse, but there are still plenty of examples of it being done successfully around the world. As with most adaptive reuse projects, there are some challenges in working with an existing building's elements—including facade structure—but most problems are not insurmountable. Sometimes a building may need to be partially disassembled to accomplish the goal. Additionally, bringing in new but complementary materials can bring new interest and identity to an existing neighborhood character.

⁵¹ Hobhouse, Jack, and Alyn Griffiths. *View of facade of 141-145 Curtain Rd. . Duggan Morris Injects New Life into Georgian Office Block in Shoreditch with Metal Mesh.*



Fig. 9: 141-145 Curtain Road as seen from street elevation.⁵²

Precedent 5: Frontier Restaurant, Albuquerque, NM

The unassuming nature of the building goes to show that third spaces can develop independently of great architecture, but they do require certain resources to survive and thrive. I visited Frontier restaurant in Albuquerque this summer and was struck by how many aspects of a good third space it had. It is located across from the University of New Mexico so it's easy access creates a regular rotation of college students. It has cheap, good food, is open until midnight, and you are welcome to stay as long as you like. Looking at it from an environmental psychology lens, it has multiple types of sociopetal and sociofugal seating in its five dining rooms, and the walls are

⁵² Hobhouse, Jack, and Alyn Griffiths. *View of facade of 141-145 Curtain Rd. . Duggan Morris Injects New Life into Georgian Office Block in Shoreditch with Metal Mesh.*

decorated with art from both local and national artists that regulars have “grown attached” to. This along with the architectonic details in the finishes create a homey vibe that is comfortable to stay in. There is plenty of natural light from big windows that look out at the University across the street. Other resources include access to outlets, the self-serve new mexican chili station, and the staff who are great at what they do. After over 50 years of serving Albuquerque, it should be no surprise that they’ve got an understanding of what makes a good third space down pat.

What I learned from it: Frontier reinforced the sentiment that good third spaces aren’t built by contractors, but community relationships. The space took two renovations and many decades to accumulate the decor, perfect the recipes, and spread its influence by word of mouth. Arguably the most influential factors in the creation of this space are its location, low cost of entry, presence of regulars, and resources such as food and tables where one is allowed to stay as long as they like. It took a long time for this space to become the icon and haven that it is, so it’s important to remember not to be disappointed at immediate outcomes of a project, but stay excited for the possibilities.



Fig. 10: Interior of Frontier Restaurant's front room.⁵³

⁵³ Interior of Frontier Restaurant's front room. Home. Frontier Restaurant.

Precedent 6: Hazard, Kentucky

In November the author had the pleasure of speaking with local teacher and city councilmember Luke Glaser about the ongoing revitalization of Hazard, Kentucky, and learned a lot about some of the specific issues regarding redevelopment in Appalachia. Glaser's passions lay in incentivizing local businesses and preventing "brain drain" by encouraging students to stick around—Hazard's population has waffled between the high 4000's and low 5000's over several years. Glaser was part of a city council initiative to provide funds for local businesses' startup costs, and they also fixed a poor policy on occupational tax. From 2019 to 2024, 72 new businesses have opened and created over 250 jobs, which the mayor of Hazard mentioned is "a lot, even if you brought in a big major industry."⁵⁴ The region's largest employer is Appalachian Regional Healthcare and they rarely donate to projects in their surrounding context, so most revitalization funds are from the city. When asked what his town is still missing programmatically, Glaser said a brewery, hotel, and places for kids/teens to hang out like bowling or a rec center. Because of floodplain restrictions, all revitalization projects have been adaptive reuse of existing buildings, which creates additional challenges. Even so, Hazard is an example of an Appalachian community well on its way to a stable future.

⁵⁴ Mueller, Caroline. "Downtown Hazard Sees Growth as Several Businesses Expand."



Fig. 11: Downtown Hazard, Kentucky, in winter.⁵⁵

Architectural projects have many levels of detail, and its important to consider all of them. The urban studies looked at how built environment and the green environment function independently and codependently. They provided things to think about when connecting a specific site to the larger context, including density's effect on transit times throughout a city, transit times to green spaces, and the proximity of green space's effect on a person's health. The study of Brooklyn Grange provided program ideas as to how to build space for a community cornerstone: where are there gaps in resources? What events/functions does a community desire? Looking at the Grange and the Shoreditch office building show two examples of adaptive reuse both structurally and

⁵⁵ Lewis, Seth M. *Photo of Hazard's downtown in winter. Odyssey.*

aesthetically. And finally, Frontier reminds us that Oldenburg's list of third space requirements really do create functional real life places. Taken together, they inform the details of this thesis better than they could alone.

Chapter 5: Zones and Program

The Missing Teeth project is all about using architecture to solve a primarily social and economic problem of lack of resources, environmental stressors, and depopulation in Central Appalachia. The project focuses on the central and southern Appalachian region due to the propensity in that area for communities that have established a strong identity, but that doesn't mean they are not in danger of fragmentation due to depopulation. The overall goal of the program is to support the identity of the community by providing buildings and spaces for the wellbeing of the residents that may attract new people and retain younger generations. The overall categories of built spaces are housing, production, and social spaces. Because one of the issues is a lack of resources, one does not want to do harm to a community by removing any more buildings than necessary but instead add resources into existing physical gaps.

Section 1: Program zones

A well-known concept of psychology is Maslow's hierarchy of needs, which postulates that a person cannot reach self-actualization without first meeting prerequisite psychological and physiological tiers of needs. One could argue a similar concept on a community scale; a community can devote the most time to self-actualization when certain more basic needs are already fulfilled.

The combination of the area of study and the application of Maslow's hierarchy results in a set of program zones: infrastructure, housing, production, and social spaces. Infrastructure supports everything; it is necessary for other sorts of spaces to function. It

moves people and energy in the form of transit, power, and water lines. Housing is somewhat self-explanatory; it provides spaces for community members to live in close proximity to each other. Production could include food and energy, and it often creates jobs. This tier allows community members to increase the amount of resources needed to live in their area and to make up for gaps in their availability, while increasing their personal capital: aka reinvesting in one's community instead of utilizing extractive development. Social spaces both provide a respite from work and a neutral playing field where political and social organizing can take place, leading to a community's self-actualization. Since it's impossible to determine the way people use a space, the focus is on creating opportunity for them instead of prescribing entirely how they should be used.

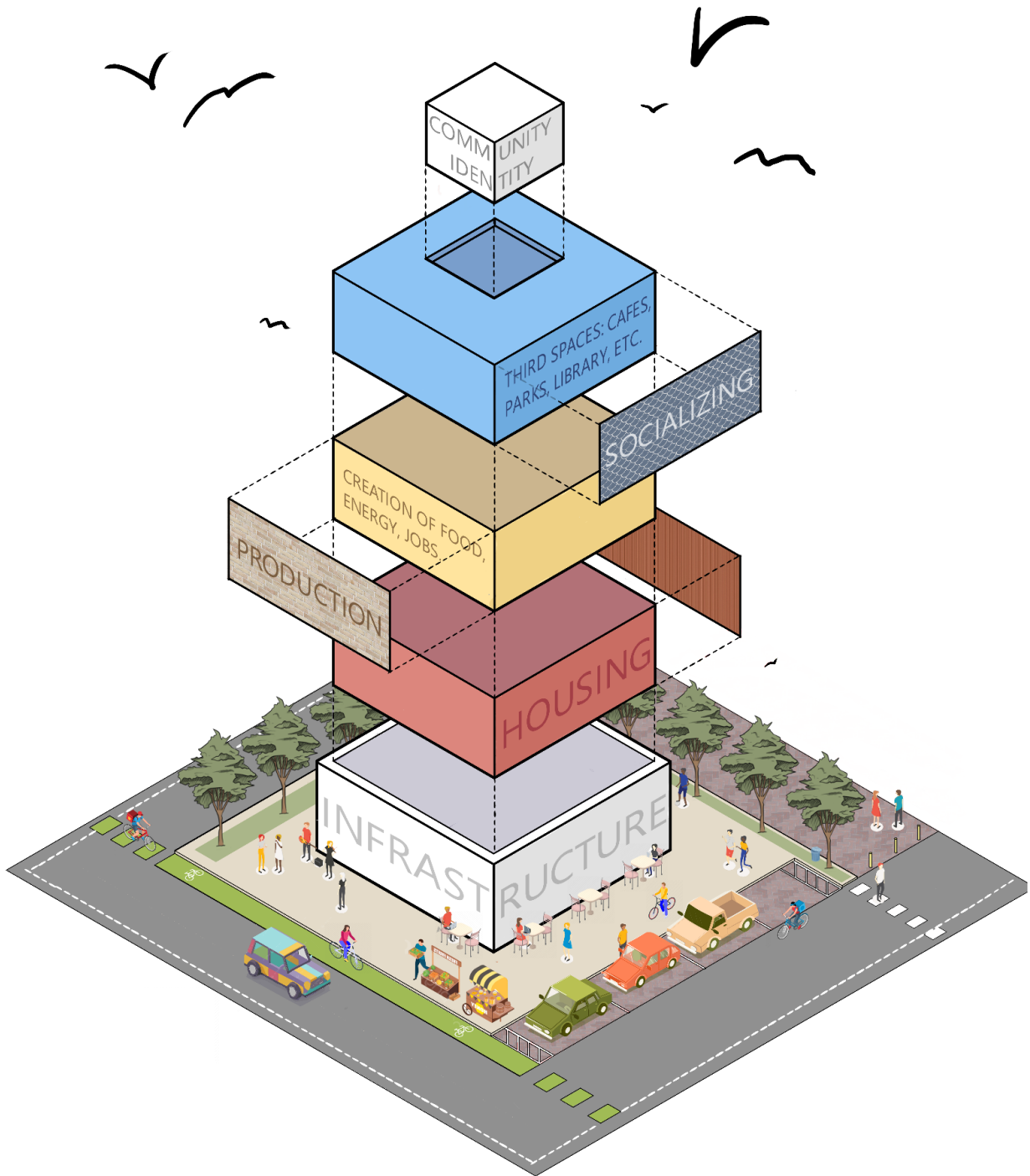


Fig. 12: Author's own drawing, dubbed "Maslow's Hierarchy" of Community Identity, demonstrating zones of program that should be in place to support community actualization.

Section 2: Precedent Justification

Of the precedents studied in chapter four, Brooklyn Grange, helps fulfill both the production and social zones of the proposed program. Brooklyn as an area is a historically minority-based neighborhood and has the second highest poverty rate in New York City's five boroughs.⁵⁶ It is currently an area with a lot of industrial spaces that has a growing restaurant and bar scene. Brooklyn Grange maintains a nod to the area context through adaptive reuse while supporting area restaurants by growing food. This also helps create jobs and volunteer opportunities through the growing and processing of the crops into meals and beverages. It also holds community events such as concerts and yoga in its covered gathering spaces. Having events at different levels of entry price are important in order to allow access to community residents of all financial abilities. In order to supplement its income, the covered spaces can also be rented out for events such as office dinners or weddings, allowing other entry prices to remain low. Additionally, the building being adaptively reused helps prevent the creation of holes in the community fabric through the raze and redevelopment process that has always threatened low-income but culturally diverse areas.

⁵⁶ "City and Borough Data." State of the City 2019.



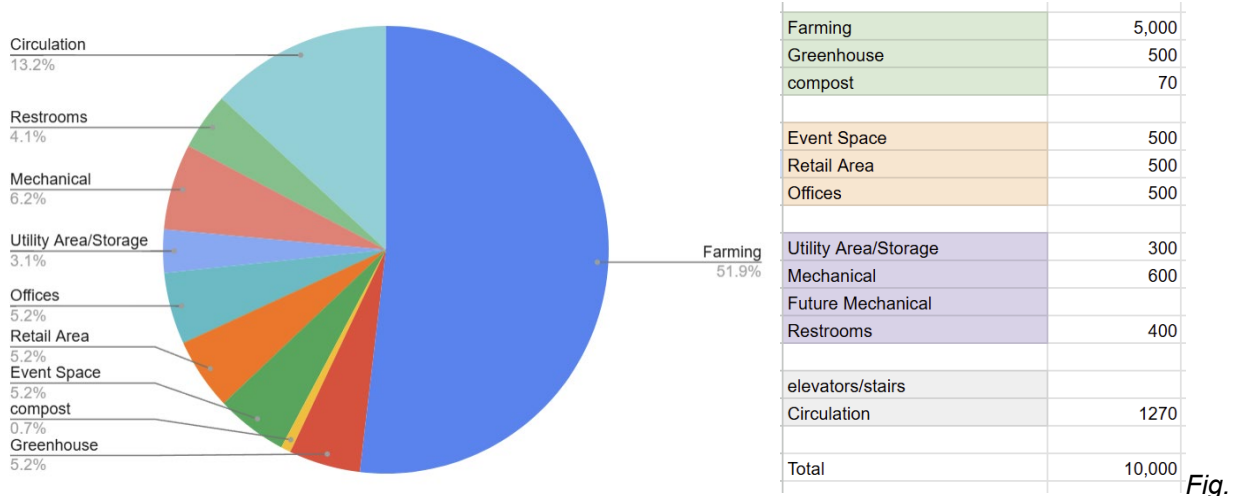
Fig. 13: Brooklyn Grange Program Diagram, by Zambrano Architects.⁵⁷

Section 3: Reverse Engineering

In order to learn about the program of Brooklyn Grange, we must engage in a bit of ‘reverse engineering’. Takeoffs were done on the Grange plan to determine the area of each type of identified program item: farm beds, greenhouse, compost, event space, retail area, offices, utility area/storage, mechanical, future mechanical, and restrooms, with vertical and horizontal circulation or unprogrammed space making up the remainder. Since the scale of the Grange is so large, it may not be applicable to most potential sites, meaning it is best expressed in percentages. About 50% of space is unprogrammed or circulatory, with another 35% being dedicated to farming. About 10% is wrapped up in built structures like the events space, greenhouse, office, and retail, and the remainder is mechanical. It is important to note that the architects left space for future mechanical in case the Grange or the building below it needed to expand.⁵⁸

⁵⁷ “Brooklyn Grange.” ZAD . Zambrano Architectural Design.

⁵⁸ *ibid.*



13: Brooklyn Grange takeoffs converted into a program study by proportion and calculated for a 10,000 SF building project. By author.

One building typology in the project could be an urban farm created from an adaptively reused building or lot at the chosen site. The current values are extrapolated and scaled down from the Brooklyn Grange to a theoretical 10,000 SF warehouse building with an attached urban lot. This would give about 5,000 SF of farming, 1300 SF of various service spaces, and 500 SF offices, retail, and events spaces. Some program such as an attached bar, restaurant, or beer garden could be added, and the program of the reused building could be kept with new program built on top, or it could be replaced with new program using a retrofit process.

Chapter 6: Site Selection and Analysis

The Missing Teeth project is all about an architectural solution to a social and environmental problem that is seen all over rural America and exacerbated in Appalachia through depopulation, lack of resources, and flooding issues. The project focuses on the Central and Southern Appalachian region due to the (often paradoxical) propensity in that area for communities with strong identity but a gradual depopulation. A core tenet of it is to not cause harm to the communities, whether that is by unnecessary removal of buildings or insensitive design. Building in the “missing teeth”-- places where there’s a noticeable gap in the built environment--provides new resources without removing any existing ones from an under-resourced area.

Section 1: Site Selection Criteria

Site selection for this project contained two levels of detail: selection of a town and selection of building site. Because of the urban and human foci, the main town selection criteria were that the site area be in Appalachia, have a community organization that was interested in working together, and have a ‘main street’ condition that contains missing teeth. The urban form criteria exist in order to differentiate a town from a suburb, since those are two different cases with different challenges. A town would need to have a defined street edge in order to identify gaps in it. Additionally, being able to discuss the town’s historical context and specific needs with residents is an important aspect of this project due to outdated or unpublished information on many locations.

Additional criteria included that the town be within in the beginning stages of revitalization as opposed to farther along and that it be within a day's drive for the possibility of an in-person visit, loosely defined as eight hours. Visiting the place is an important activity for researching a design solution, as it adds an additional layer of embodied knowledge to the designer's approach that is more detailed, shows depth of understanding, and is more sensitive to the needs of the people and environment.

Another angle to the project is resilience after flooding. Steep slopes channel all the area rain rapidly into valley creeks and rivers where many towns are built on the adjacent floodplains due to their flatness. Hundred-year storms spurred by climate change are becoming a more frequent occurrence in the Appalachian region, so it was important to the project to talk to a town who has had flooding issues in the past.

The building site selection was decided based on floodplain information, building and lot vacancy, building ownership and value, and community opinions on program and location, and will be discussed later on.

Section 2: Site Selection Process

First, initial inquiries as to towns with the above criteria were sent to my primary contacts to get advice on towns to look into and community members to talk to. Second, a master list of potential towns was compiled and evaluate for the first three criteria. Third, about ten towns were chosen to contact by way of emailing community organizations such as libraries, historical societies, city councils, and other independent organizations. Fourth, a dialogue with respondents was opened to gauge initial interest and if that went well, an initial meeting was set. Fifth, initial meetings were conducted

and a site selection matrix used to evaluate pros and cons of a selected list of towns. Sixth, a final decision was made on the town of Pound and work begun with the town to select a building site and tailored program.

Section 3: Town Site Selection

The site selection matrix shows the criteria alongside six towns, narrowed down from an initial list of 33 due to their strengths in various criteria. It was necessary that the final town meet all criteria to fulfill the goals of the project. Both Hazard, KY and Pound, VA gave initial positive responses from community contacts, but Hazard is already conducting revitalization projects which could limit this project’s ideas, so it became a precedent. I have already visited and know parts of Pennington Gap. Princeton had great urban form, LaFollette a great potential building site, and Mullens and Rainelle have experienced catastrophic flooding in their past. In the end, Pound responded with the most interest and met the rest of the criteria, so it became the final selection.

Site Selection Matrix	sites						
criteria	Hazard, KY	Rainelle, WV	Pound, VA	Princeton WV	Mullens, WV	LaFollette, TN	Pennington Gap, VA
is in central/southern Appalachia	x	x	x	x	x	x	x
urban form: missing teeth, main street, manageable size	x	x	x	x	x	x	x
Is in the beginning stages of revitalization		x	x	x	x?	x	x
has community org I can get in contact with	x	x?	x	x?			x
I have contacted community org	x		x				x
has strong community network	x	x	x	x			x
extra: has had history of flooding/rebuilding		x	x		x		
extra: close enough to visit	8hrs	5hrs	7hrs	5.5hrs	6hrs	8hrs	7hrs
population (2015)	5218	1481	976	5971	1446	7010	1794
Population (2019)	4868	1529	922	5674	1314	6671	1732
population (2020)	5213	1189	866	5850	1469	7422	1609
Population (2023)	4964	1159	844	5642	1383	7242	1577

Fig. 14: Site selection matrix, alongside population fluctuation data. Data shows that several towns are slowly decreasing, one is waffling, one is increasing, and several saw significant change in either direction from 2019 to 2020. Author’s own.

In determining whether a town met the urban form requirements, Google Earth was utilized to view the street system from above and ‘walk’ down the streets to evaluate the level of continuity of the streetedge. Below are a few examples:



Fig. 15.1: Pound, VA aerial footprint. Population 844 in 2023. Google Earth 9/1/2023.



Fig. 15.2: Pound, VA street perspective looking NW. Google Earth.

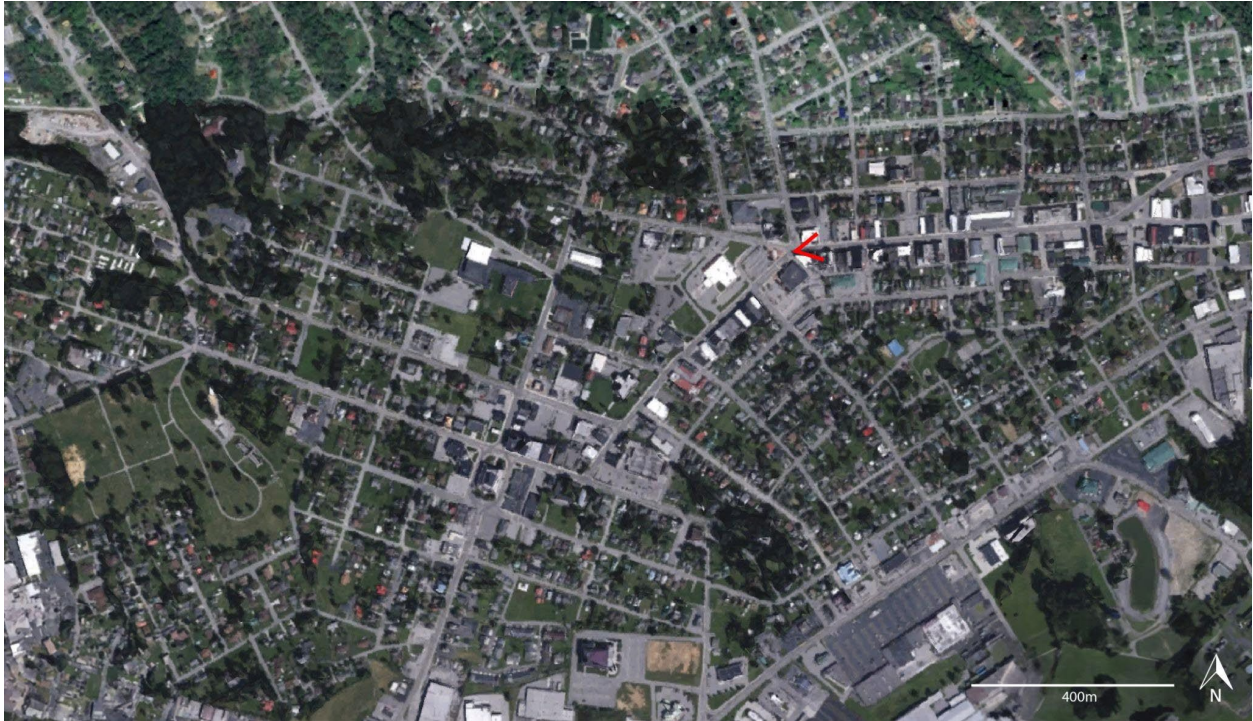


Fig. 16.1: Princeton, WV aerial footprint. Population 5642 in 2023. Google Earth 10/5/2013.



Fig. 16.2: Princeton, WV street perspective looking NE. Google Earth.

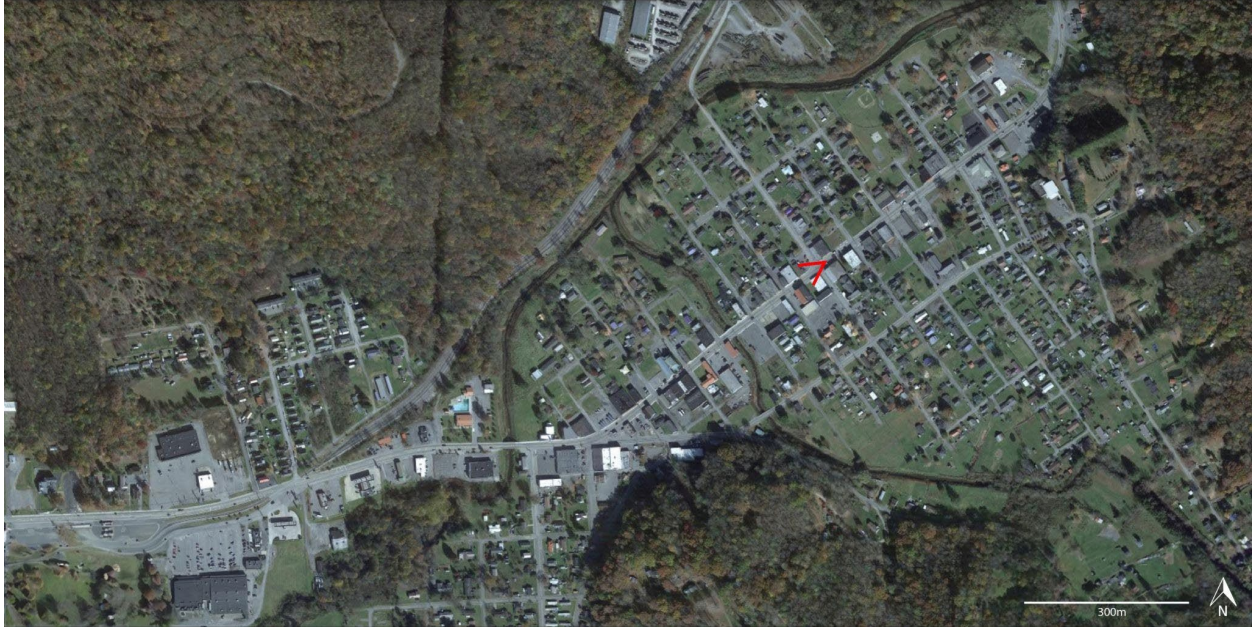


Fig. 17.1: Rainelle, WV aerial footprint. Population 1159 in 2023. Google Earth 10/22/2022.



Fig. 17.2: Rainelle, WV, street perspective looking SW. Google Earth.



Fig. 18.1: Pennington Gap, VA aerial footprint. Population 1577 in 2023. Google Earth 4/13/2024.



Fig. 18.2: Pennington Gap, VA street perspective looking NE. Google Earth.

Section 4: Site Analysis

Subsection 1: Demographics

Pound, Virginia, also known as “The Pound”, had a population of 922 in 2022. It is home to a primarily aging population with a median age of 45, and the median household income is \$28,750, putting it well below the US median income in 2022 of \$77,540. The median property value is \$98,400, which while it is increasing, is also significantly lower than the national average of \$281,900. 79% of housing is owner-occupied.⁵⁹

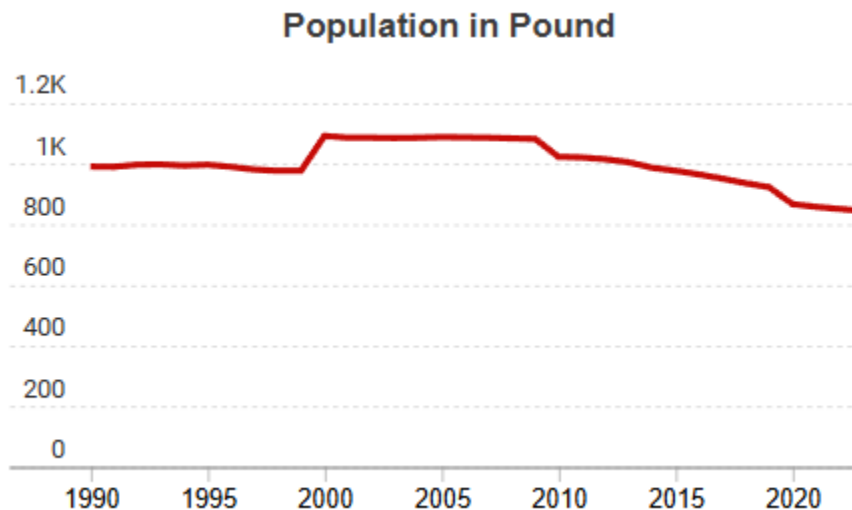


Fig. 19: Population trends in Pound, VA, from 1990 to 2023.⁶⁰

Subsection 2: History

There are a few theories about how the town got its name, but the most likely is from the establishment of a horse-powered mill in 1815 that pounded grain into flour. It became a central place where “people brought their turns to The Pound...and people

⁵⁹ “Pound, VA.” Data USA.

⁶⁰ Bureau, United States Census. “Populations and People.” Pound town, Virginia.

have been saying “The Pound” ever since.”⁶¹Wise County’s first post office was established there in 1848, and it grew steadily in parallel with the coal industry through the early 1900’s. Pound is not a coal town, but coal mining was and still is a large industry in Southwest Virginia and it saw many residents and visitors from neighboring company towns.⁶²It was finally incorporated in 1950, ironically the oldest settlement in Wise County but the last to officially become a town. The mill that started the town was washed away in a flood in July 1942.⁶³ After World War II, many of the coal veins in Southwest Virginia that had “begun operations more than fifty years earlier were mined out”⁶⁴ and the industry began its slow decline.

Today, mining still supplies some jobs in Pound but the town does not have any one major production industry. The area economy employs 244 people and its largest industries are Healthcare, Retail, and Public Administration, while the highest paying industries in the area are Agriculture, Forestry, Fishing/Hunting, and Mining/Resource Extraction.⁶⁵ The town has noticed significant deterioration in the upkeep of many buildings, as well as landslide damage to a bank on main street, and they are interested in revitalization efforts including an amphitheater and pocket park.⁶⁶

Subsection 3: Environmental Hazards

Pound’s main environmental hazards are topographically related: flooding and mining. There are both an operating coal mine and a closed surface mine in a two mile

⁶¹ “Pound Origin.” The Origin of the Town of Pound, 2021.

⁶² Information from oral account by the Vice Mayor of Pound, 20 November 2024.

⁶³ “Pound Origin.” The Origin of the Town of Pound, 2021.

⁶⁴ “The Coal Fields.” Virginia’s Coal Towns, October 27, 2001.

⁶⁵ “Pound, VA.” Data USA.

⁶⁶ Information from oral account by the Vice Mayor of Pound, 20 November 2024.

radius from the center of town, as well as reports of abandoned mine openings in the area.⁶⁷

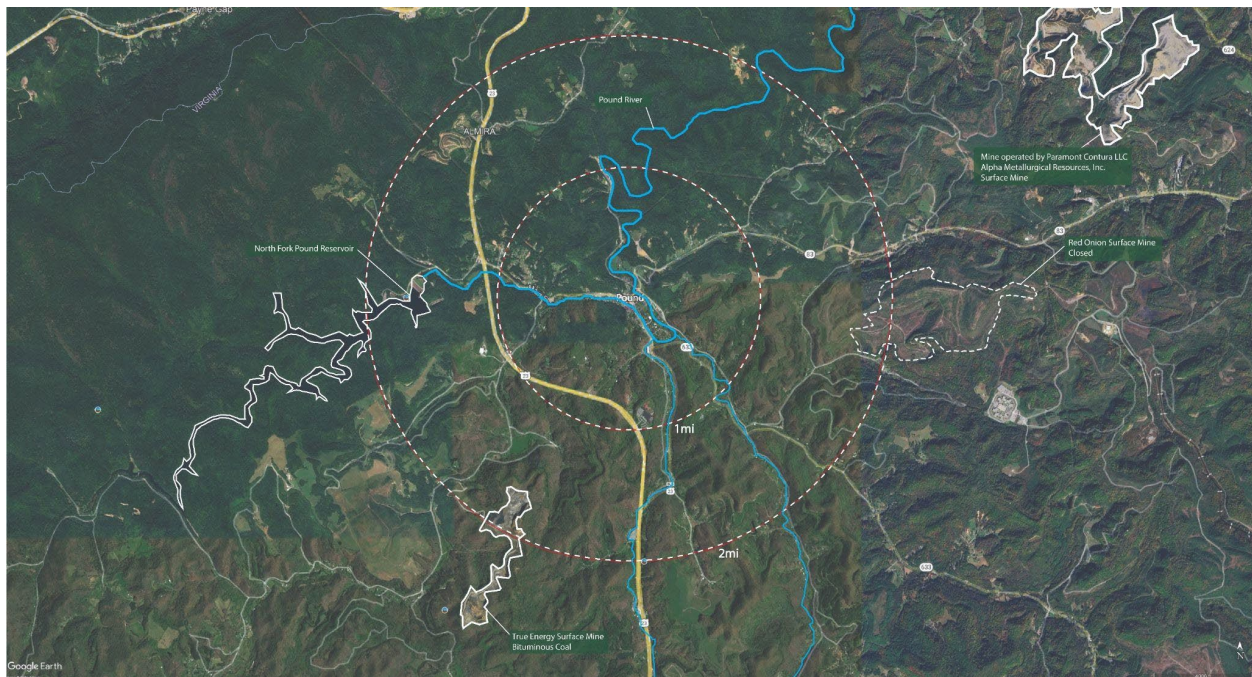


Fig. 20: Environmental hazards surrounding Pound, VA, including the Pound River, one active and one inactive surface mine within two miles of the town center, and one active surface mine within about four miles. Author's own.

The bordering mountains are about 2000-2100 ft above sea level respectively, and the town itself sits at 1500 ft in the floodplain of the Pound River. The most notable recent flood happened in early July 2022, and was part of a larger major storm event that even sent hail and trees falling in College Park. The storm caused severe damage in Buchanan, Tazewell, and McDowell counties in Virginia and West Virginia,⁶⁸ and 13 counties in eastern Kentucky were declared federal disaster areas in the wake of the event.⁶⁹ Some sources report a rain rate upwards of 4 inches per hour at times,⁷⁰ and

⁶⁷ Keeling, Jeff. "Pound, Va. Home Blocked by Coal Mine Runoff ."

⁶⁸ National Weather Service Offices Blacksburg, VA and Charleston. "Southwest Virginia Flooding: July 2022." ArcGIS StoryMaps, October 12, 2022.

⁶⁹ Klesta, Matt. "Resilience and Recovery: Insights from the July 2022 Eastern Kentucky Flood."

⁷⁰ *ibid.*

the mountains caused the storm to stall out and drop massive amounts of water for four hours.⁷¹ Areas of Pound were inundated with a few feet of water, damaging homes, commercial buildings, and prompting residents to evacuate. Other towns just 40 miles northeast of Pound such as Pilgrim's Knob and Whitewood VA, saw homes lifted off their foundations and roads swept away as creeks rose almost ten feet.⁷²

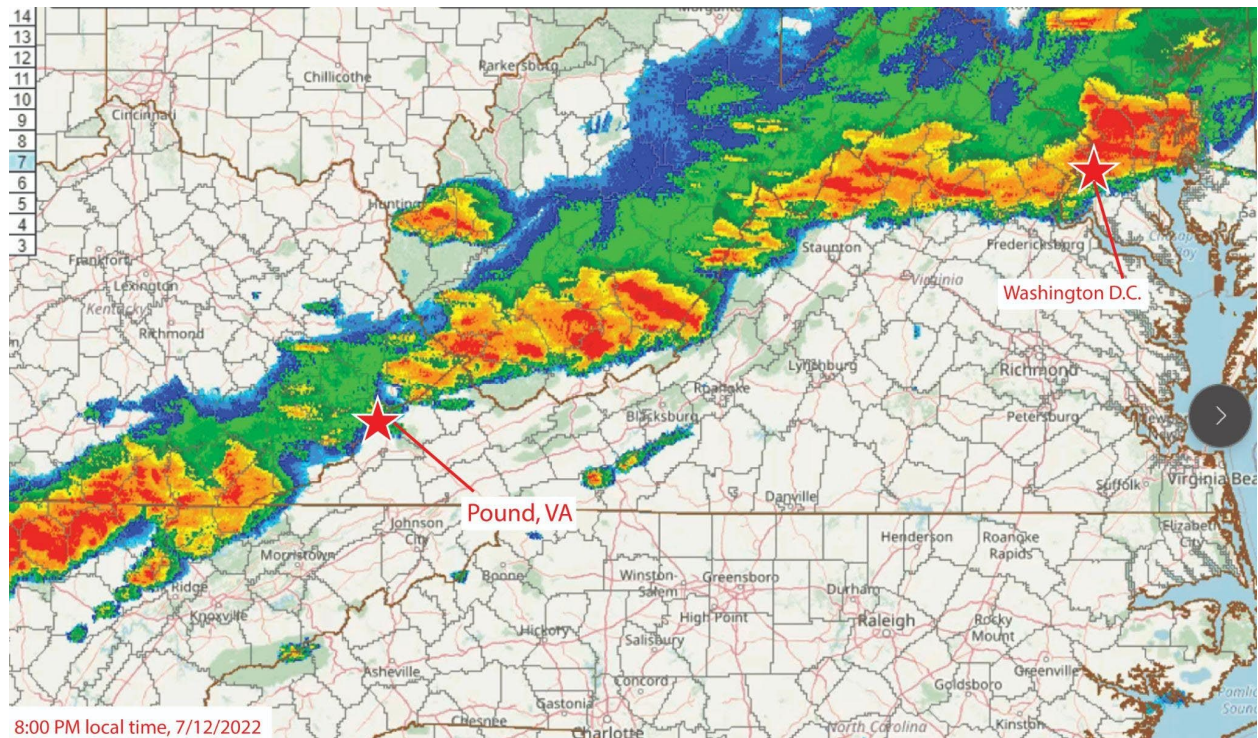


Fig. 21: Storm system that traversed the east coast on 7/12/2022.⁷³ When the front came through College Park at about 8 P.M. EST, my partner and I were out doing groceries and pulled a u-turn to try and out-drive the hail.

⁷¹ National Weather Service Offices Blacksburg, VA and Charleston.

⁷² National Weather Service Offices Blacksburg, VA and Charleston.

⁷³ *ibid.*



Fig. 22: house moved from its foundation in Whitewood, VA.⁷⁴



Fig. 23: flooding in Pound, July 2022, on Main Street looking West.⁷⁵

⁷⁴ Clubb, Michael. *A house that was moved off of its foundation rests among debris and mud, Thursday, July 14, 2022 in Whitewood, Va*

⁷⁵ Sheriff's Office, Wise County. *Flooding in Pound, Va. . NBC 8 News. WRIC, July 28, 2022.*

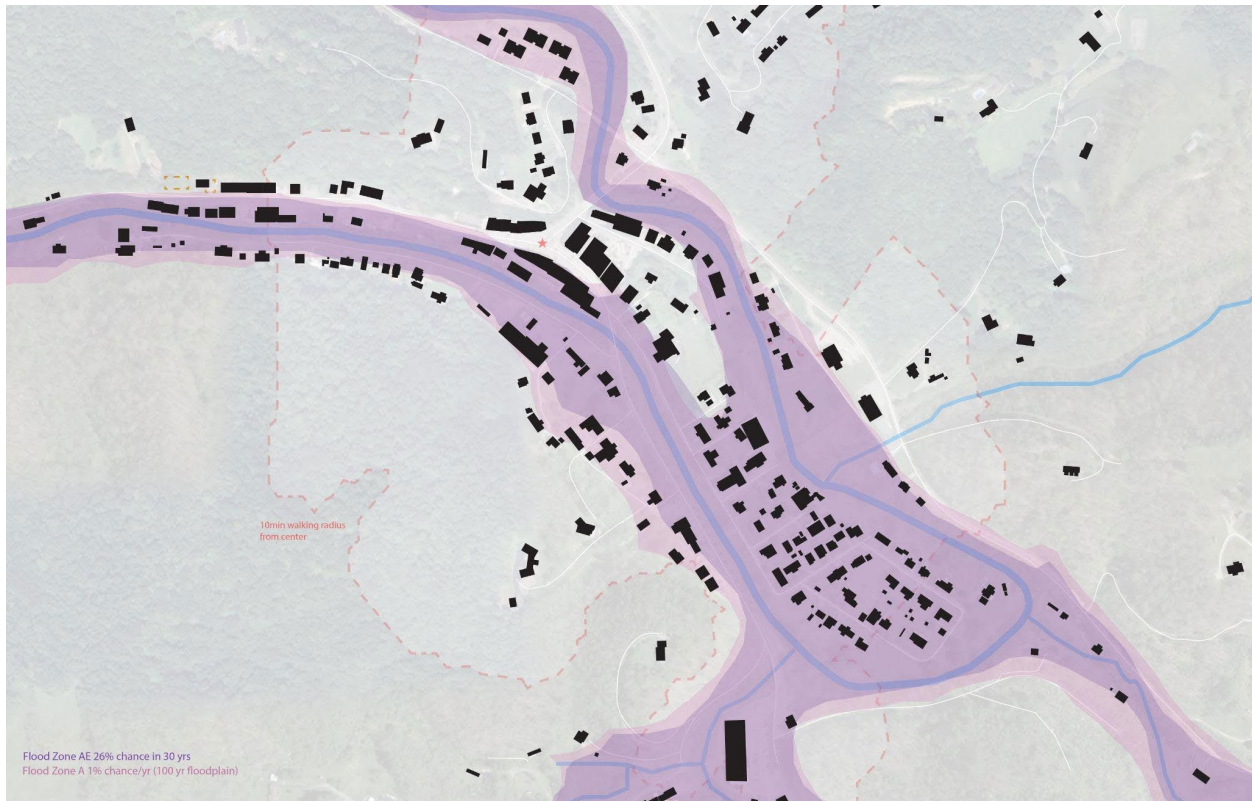


Fig. 24: floodplains in Pound. Pink is the 100-year floodplain, with a 1% chance of flooding per year. Purple is flood zone with a 26% chance of flooding over the course of a 30-year mortgage. Author's own.

Subsection 4: Transportation Corridors and Resources

Four miles north of the town is a ridge nearly 3000 ft high that stretches for about 120 miles along the Kentucky-Virginia state line. There are only a handful of crossing points, including the Pound Gap and the famed Cumberland Gap, and they are important access points for highways to bring goods and people through the region. Pound is only a slight detour off of US 23 N, a highway that carried 6000 vehicles per day in 2022. Highway 83 E passes through Pound and carries almost as much traffic.⁷⁶ The nearest towns are Jenkins, KY, to the north (8 miles), Clintwood, VA to the east (9 miles), and Wise, VA to the south (11 miles). Regional resources around Pound include

⁷⁶ "VDOT Bidirectional Traffic Volume." Map Viewer, 2022.

a selection of trails and outdoor recreation areas, some industrial businesses, and the Red Onion Department of Corrections, a prison employing some people of the town.⁷⁷ Resources within the town limits include a multitude of both chain and small businesses in food service, auto repair, and retail, including a dog grooming salon and bakery. There are seven churches and two gas stations. Also notable is Vonda's Hometown Restaurant, which also acts as a social space.⁷⁸



Fig. 25: Major highways and access points to Pound. Author's own.

⁷⁷ Information from oral account by the Vice Mayor of Pound, 20 November 2024.

⁷⁸ *ibid.*

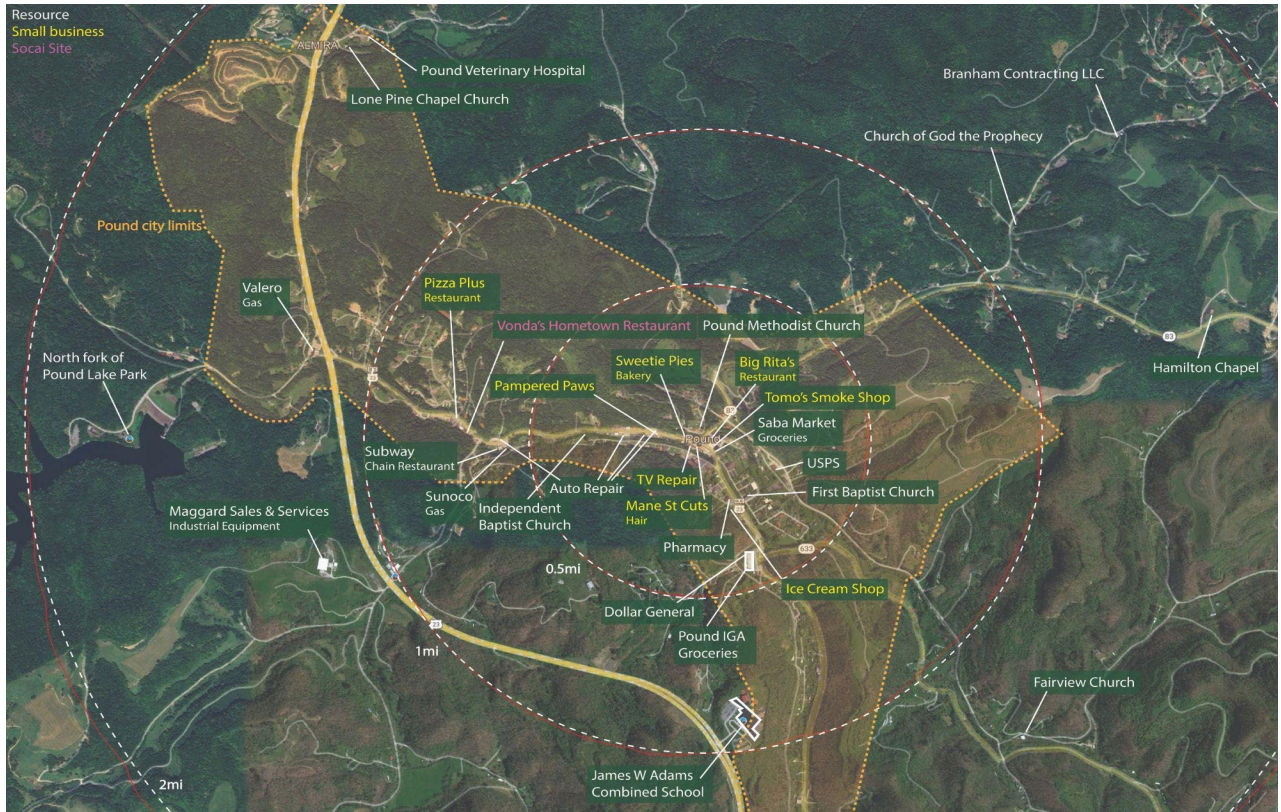


Fig. 26: Every establishment within a 2-mile radius of Pound, sorted by small businesses and social spaces. Author's own.



Fig. 27: Identified missing teeth in Pound: vacant lots, vacant buildings, buildings that are too short. Author's own.

Subsection 6: Missing Teeth

The types of missing teeth that can be found in Pound are vacant buildings, empty lots, and buildings that are a candidate for the adaptive reuse strategy of vertical addition. One notable takeaway from viewing the figure-ground is the gap in the main street to the west of the town center. Connecting the two sides with an architectural solution could provide more space for amenities like shops, apartments, and civic needs, as well as a more cohesive and walkable main street experience for residents and visitors alike.

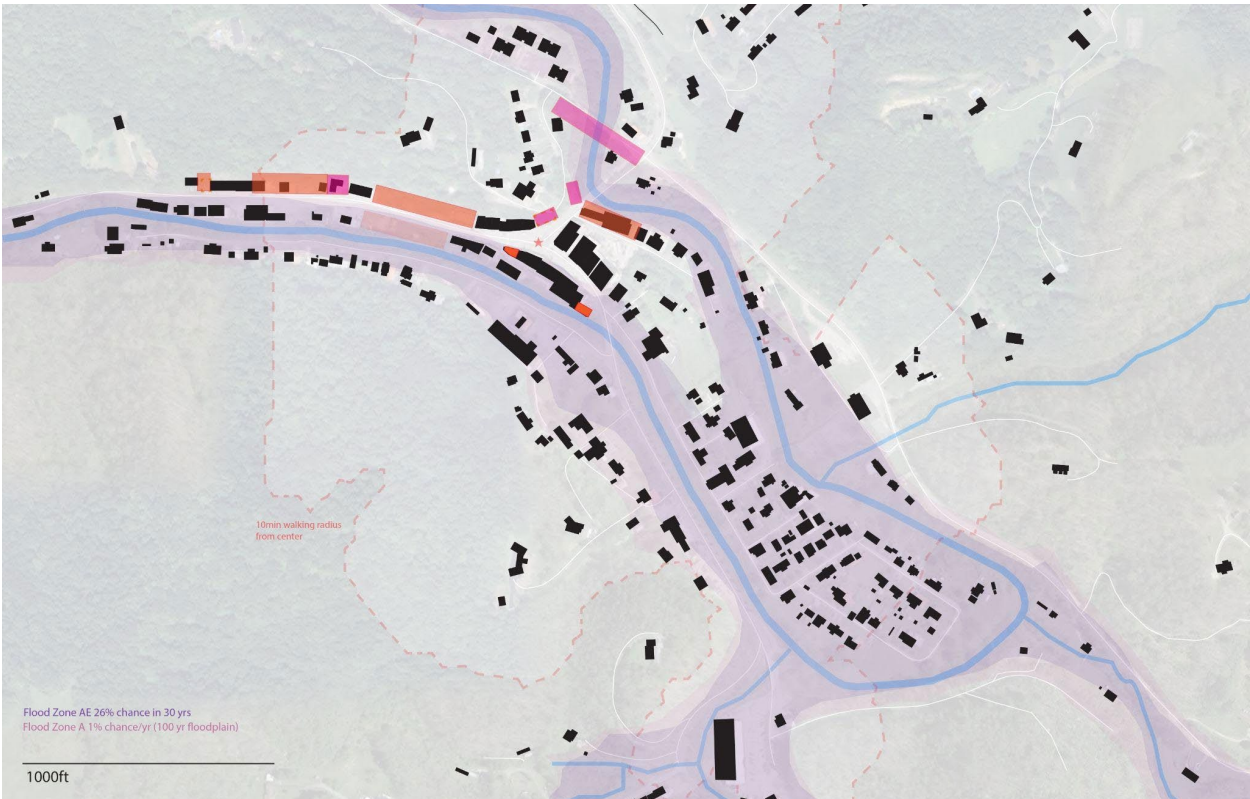


Fig. 28: Potential sites: lots owned by the town are pink; private lots are orange. Author's own.

From these missing teeth are extrapolated potential sites by adding in the layers of floodplain and ownership; putting in new buildings on an empty lot is cost-prohibitive if the lot is in the floodplain or if the land is owned by a private person and is too

expensive. Therefore, sites that remain are either comparatively cheap, already owned by the town, and/or candidates for adaptive reuse if within the floodplain.

Section 5: Building Site Selection

The initial meeting with the group representing Pound, Virginia included the Vice Mayor, members of the Historical Society of the Pound, and a representative from Appalachian Voices. The initial research and diagrams were presented to them so that they could correct any misinformation, and initial site studies were also shown. The group was most interested in a site that would connect the buildings on the western edge of Main Street back to the center of town.

The goal of the project is a masterplan for the town of Pound, including 1-3 buildings developed in detail that fit the program zones of housing, production, and social spaces. They will utilize adaptive reuse as well as new building infill of the large street gap, and explore strategies to safeguard the structures in the floodplain from potential water damage. The sites of focus are labeled A, B, and C respectively in red, while sites in orange are candidates for addressing gaps in the streetfront with a kit of parts. All are located within the 10 minute walking radius from the center of town.



Fig. 29: Building site selection for development in Pound, VA. Author's own.

Chapter 7: Discovery Phase and Conceptual Testing of the Thesis

In a project as site-specific as this one, a thorough site analysis played a major role in the development of a tectonic language that included both urban and building design. The major takeaway from study of the floodplain was that the missing teeth in the town's main street needed to be treated differently based on whether they were located in the north or south side of the street. The north side, being entirely out of the floodplain, can be infilled with habitable spaces—defined by building codes as an area for living, sleeping, eating, or cooking, and in this project meaning spaces meant for constant occupancy. The south side being within the floodplain means it is filled with non-habitable space, or space meant for temporary occupancy. For the most part, habitable spaces are buildings and non-habitable spaces are pavilions, parks, and landscape design.



Fig. 30: Author's own. Conceptual drawing from early in the design process illustrating the different strategies applied to the north and south sides of the street.

Section 1: Urban Tectonics

The overall design is to install a grid system over the town that can provide structure for both new habitable and non-habitable spaces. It also acts as stabilization for the land in the hills and adjacent to the water.

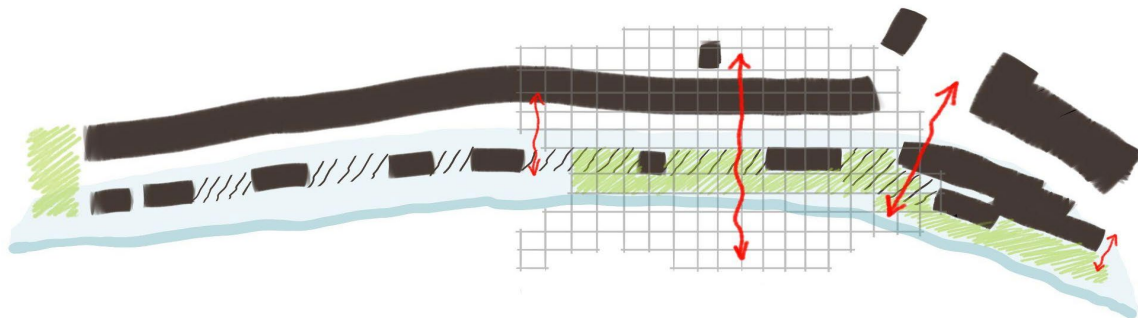


Fig. 31: Author's own. Urban parti diagram showing the applied grid strategy, main street crossings, green spaces, habitable spaces (poche) and non-habitable spaces (hatch).

With this comes a material language that varies in strength and porosity depending on where it is located: concrete to withstand heavy floodwater without damage, steel to provide structure within the town proper, and wood that can sit on top to create a second story and stay away from the water.

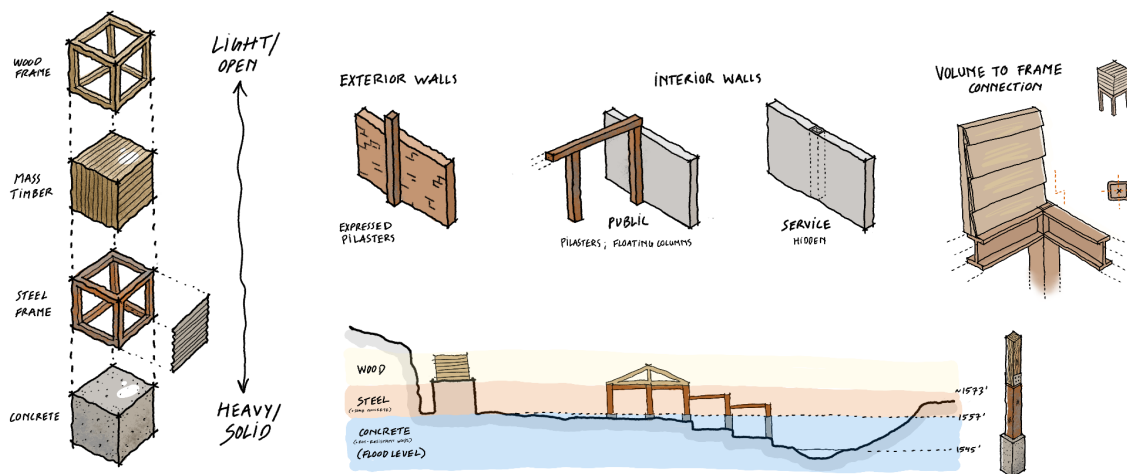


Fig.

32: Author's own. Diagram of the tectonic strategies in the urban and building designs.

Wood was chosen because of the area’s abundant timber resources. Both hardwoods and softwoods live in the region and species like spruce-pine-fir, hickory, cedar, hemlock, and oak work for both structural and sheathing purposes. Steel, especially the patina of corten steel, is reminiscent of the railroads and industrialization of the area. Accents include shale, a naturally occurring rock in the adjacent hills, and pops of color from funicular shading structures, representing the vitality of the town and its future. All together the materials respond to a type of grit that Appalachian culture is known for, one that perseveres despite attempts to let it die out.



Fig. 33: Author’s own. Textural collage of the material choices for the design language.

Programmatically, the urban design ascribes to the aforementioned “Maslow’s Hierarchy of Community Identity”: social spaces, housing, and a production component that can further be divided into economic production via tourism and investment into

small businesses. Larger park and civic spaces provide opportunity for the tectonic language to create an entire experience and make the town an interesting place to visit, while smaller spaces are reserved for the social strengthening of the current residents' community ties. The largest gap provides a whole new shopping street area and housing is installed on top.

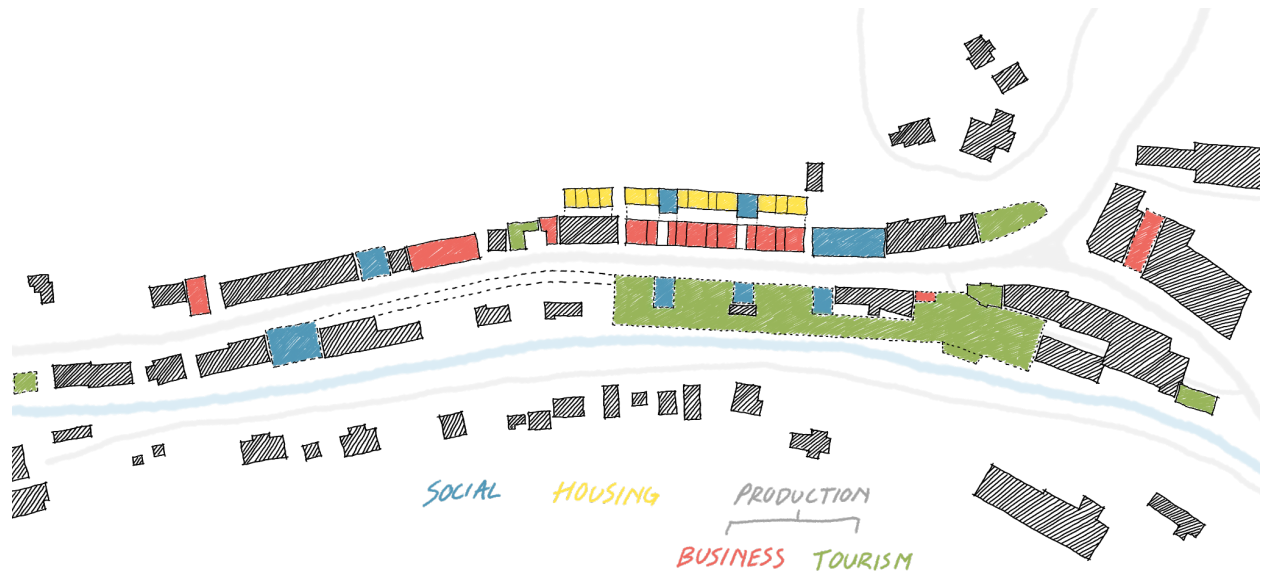


Fig. 34: Author's own. Program diagram based on color to describe locations of space types.

There are several moves that the town of Pound is already making, and the urban tectonics intend to fold them into the larger vision. These are murals and pocket parks. Murals are an inexpensive way to improve a building's facade and add the aforementioned pop of vitality through color, while pocket parks install program in place of an empty lot less expensively than a building. The grid system leaves some strategic gaps that surround existing murals and a currently proposed pocket park to be flexible in accommodating the town's own vision. It also takes inspiration from one mural in particular—of a historical figure named Granny Shores—where members of the town each designed a patchwork quilt square that was included in the blanket. This now

extends over the town where the grid is infilled with blocks of colorful sunshades, looking like a quilt from the air and protecting the occupants below.

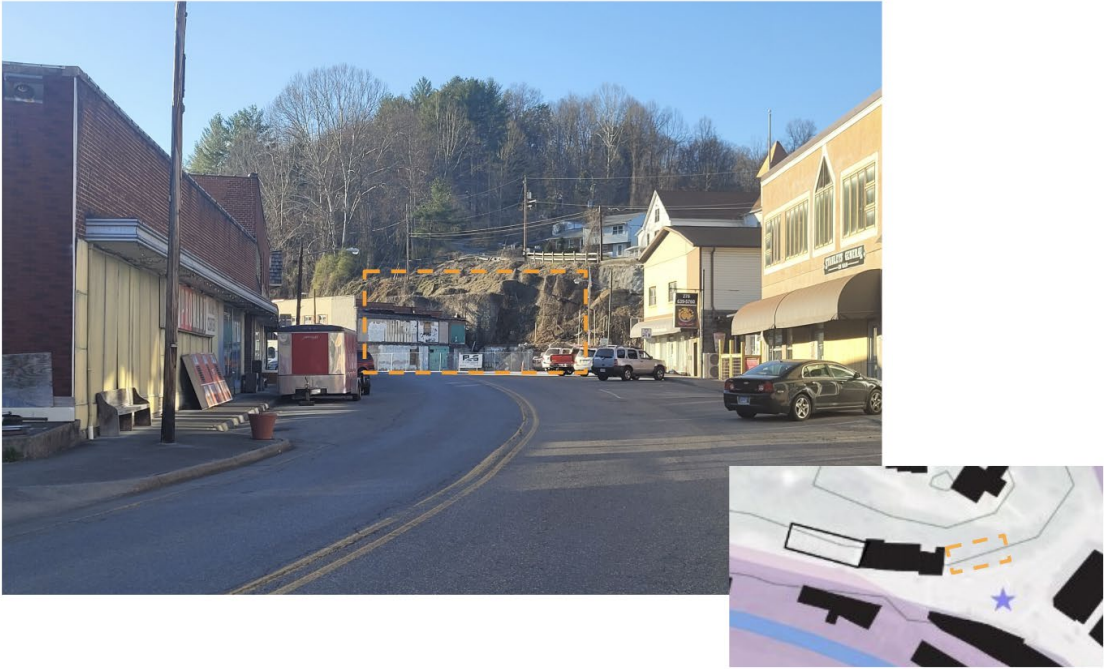


Fig. 35: Google Maps images showing existing murals and location of future pocket park.

Section 2: Building Tectonics

The buildings are meant to be an extension of the grid but arise out of it as landmarks. The idea of vertical addition was intriguing and fit nicely between the needs of the town to stabilize existing building stock, create new spaces, and test a type of building on the frontier of architecture. A system of steel encapsulates the existing structure, allowing the vertical addition to rest upon it and not depend on the building below for support. The buildings, too ascribe to the three levels of concrete, steel, and wood, creating consistency in the knowledge of what is new and what is old.



Fig. 36: Author's own. First image is a sketch drawn in fall 2023 that became a defining idea that desired more exploration, and second image is from the final design.

Section 3: New Precedents

Some design precedents that were referenced along the way for concept and form were the Nagakin Capsule Tower in Japan, a modular housing design for apartments in metabolist style, and the Zinc Mine Museum by Peter Zumthor for its railroad-reminiscent design and elevation on stilts. Additionally, Green Jean's Food Hall

in Albuquerque, New Mexico was referenced for its stylistic quality of steel, pops of color, and funicular shading structures.



Fig. 37: Google Maps images of Green Jean's Food Hall in Albuquerque, New Mexico. The tectonics of this location were a visual influence on the final design.

Section 4: Conclusion

Site analysis was a lengthy and near continual process that contributed massively to the final design's tectonics. Only after extensive diagramming, consumption of statistics, and visiting the site could a cohesive language emerge that addressed many factors: the residents' program needs, available materials, structural integrity of the land, presumed costs, ownership and ability to build on sites, and the regional culture and local history of Pound.

Chapter 8: Conclusion, Thesis Design Solution

The final design proposes an overall urban strategy and three focus buildings: a landmark building focused on tourism, a civic building focused on the community members, and a modular housing unit.

Section 1: Urban Design

The urban design strategy creates a tectonic language of a grid system that extends over the urban fabric's missing teeth, strengthening and protecting existing structures while creating new structure for new spaces to emerge. Since the North side of the street is fully out of the floodplain it can be outfitted with habitable space, while the south side within the floodplain is infilled with non-habitable spaces (represented by hatch).

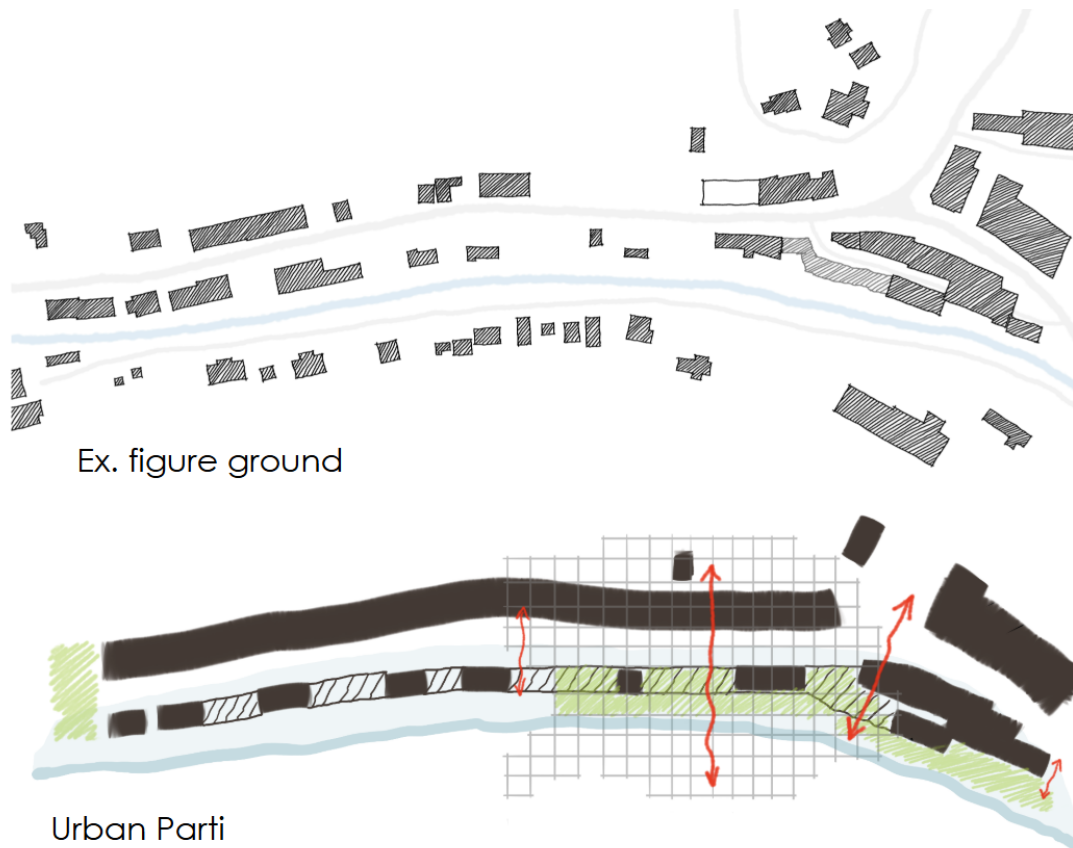


Fig. 38: Author's own. Proposed urban parti juxtaposed with the existing figure ground.

Here we start to break down the proposed new urban fabric by type of missing teeth: fitouts or adaptive reuse strategies that fill vacant buildings, new habitable buildings that fill gaps in the street wall, and non-habitable spaces that fill gaps in the street wall.

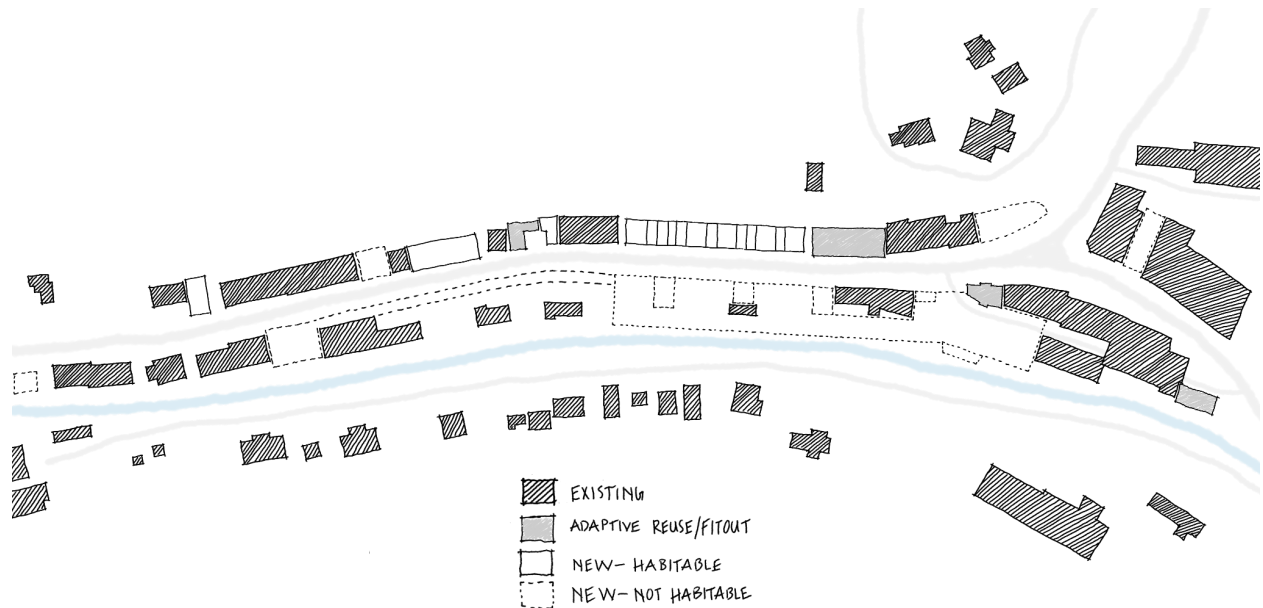
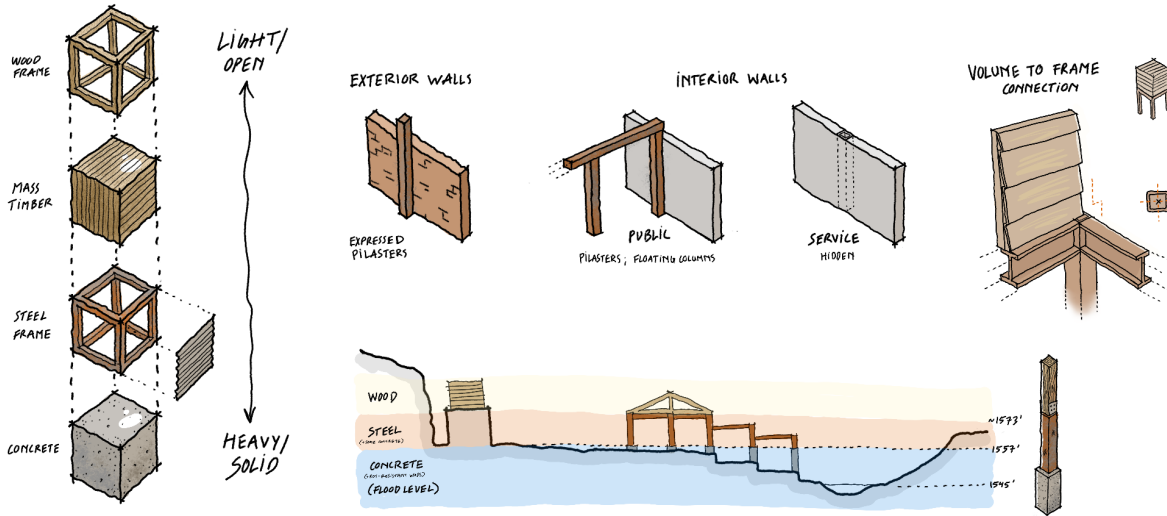


Fig. 39: Author's own. Diagram of existing buildings, adaptively reused buildings, new "habitable" spaces and new "non-habitable" spaces.

The grid system in the parti is designed to vary in porosity and strength depending on where it is within the site. The heaviest, strongest materials are meant to be able to live within the floodplain, but remain structurally open to allow water to flow through it without causing major harm. Concrete bases mark the FEMA flood elevation, then corten steel columns emerge, which weather naturally and are completely recyclable at the end of their life. All second stories are primarily of wood or wood frame depending on the proximity to the floodplain, and any wood close to water is of a rot-resistant species.



GRID KIT OF PARTS

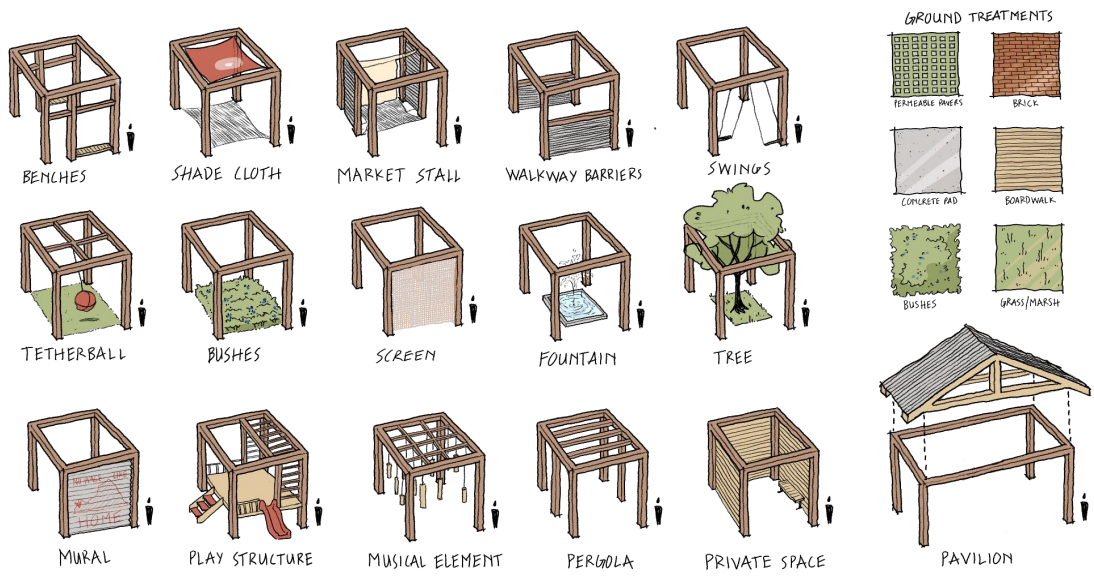
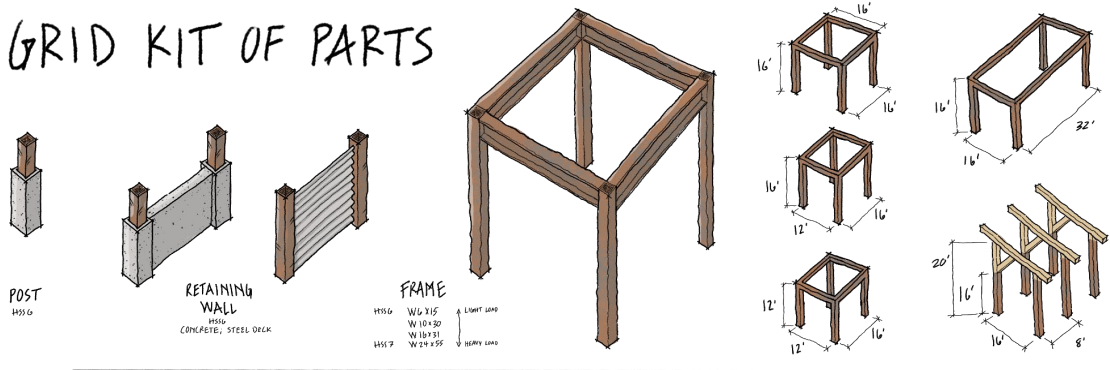


Fig. 40: Author's own. Diagram describing tectonic strategies and grid kit of parts, showing dimensions and program suggestions for the grid-based parks.

The grid system is organized into a few distinct sizes for maximum flexibility. The park and riverwalk system can then be assembled to the residents' taste from various elements, or even changed in the future. At either side - river or mountain - the grid starts to conform to the natural context. The boardwalk snakes to follow the river, and to the north side of the street, the grid begins to disintegrate into a system of piles and retaining walls that act as slope stabilization and protect buildings from being damaged by sliding slopes.



Fig. 41: Author's own. Portion of urban plan illustrating the dissolving grid at either edge.

Part of the site specific approach - alongside working with the natural forces - is tailoring the urban program, which for this project includes social spaces and housing to help counter depopulation, and spaces intended to be economic drivers. Appalachia's rich natural context means many towns are turning to eco-tourism to boost local economies. For Pound, this means creating spaces that have a unique experience that encourage people to come visit and spaces for small businesses to create an attractive shopping street like it was back in the day for the neighboring coal towns.

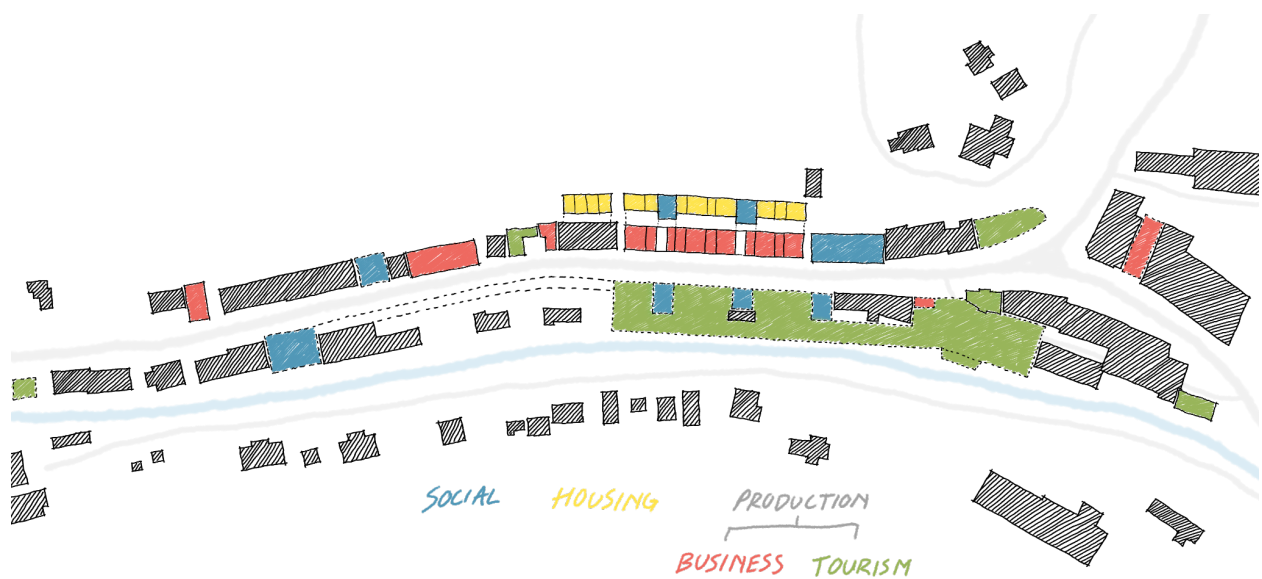


Fig. 42: Author's own. Program diagram organized by color.

From this starts to create new places and a cohesive vision. If visiting, one might stay at the small hotel on the main street to attend a music festival at the outdoor amphitheater. They could visit the hiking hub and grab some supplies before taking a walk along the river or renting a kayak near the east gateway. If they're into history, they can visit the storytelling park, historical society with its new pavilion, or book a guided mural walk or ghost tour at the tourist center in the old town hall. Perhaps someone is a local resident and wants to take their dog to the dog park, grab lunch in the Town

Square, window shop, or pick up an item at the library. Walking back down the street one will encounter a few pocket parks before possibly turning around at the new kayak launch at the west gateway.

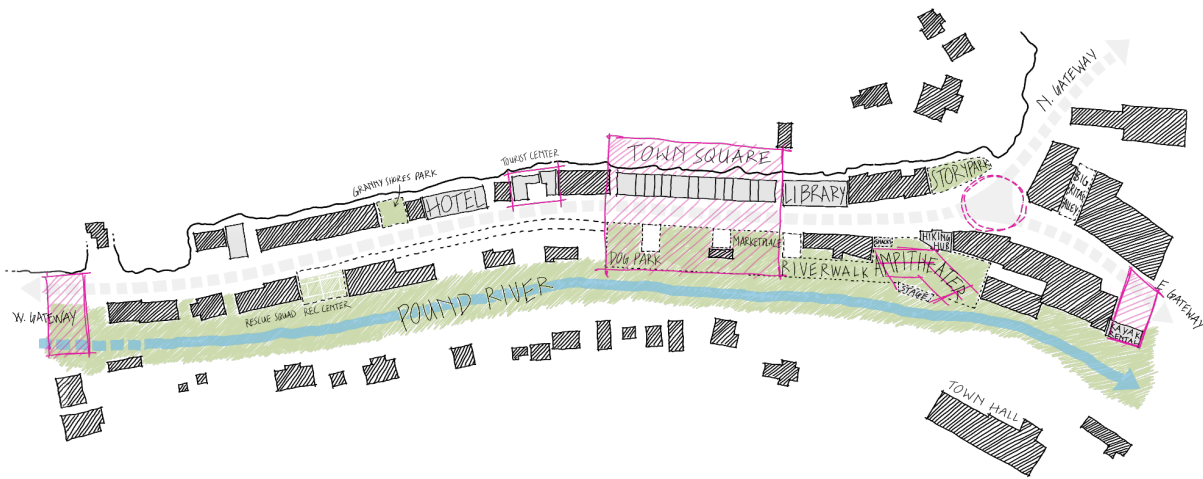


Fig. 43: Author's own. "Places" diagram showing new notable spaces in the town.

Here's a way to see into some of the spaces of the riverwalk system - the historical society pavilion, or a vendor plaza that can be hosted alongside.

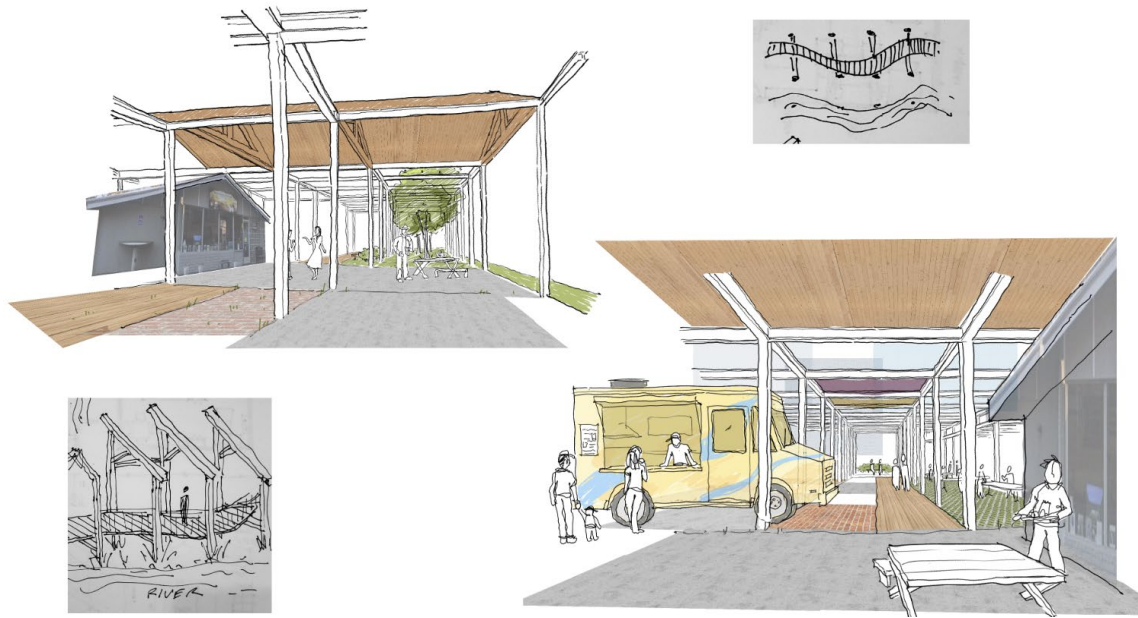


Fig. 44: Author's own. Elements of the grid park "riverwalk system" as shown through sketches and vignettes. Vignettes taken from the historical society's new pavilion.

This is a view towards the music venue that could be used for regional concerts or even just busking - some inspiration was taken from the riverwalk in Charleston, WV, and perhaps the Pritzker Pavilion in Chicago.

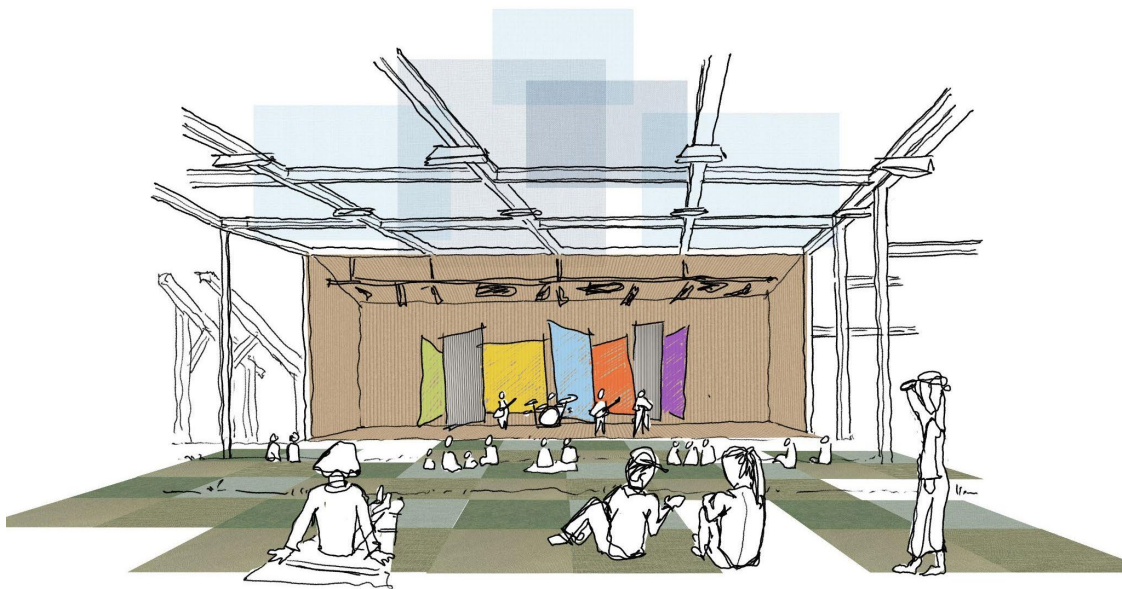


Fig. 45: Author's own. Vignette of the amphitheater space.

Section 2: The Hiking Hub

The town of Pound sees plenty of people drive through, but not many people stay. The three focus buildings can be organized into short, medium, and long-term retention strategies, answering the questions “why would someone stop here?” “why would someone return here?” and “why would someone stay here?”



Fig. 46: Google Maps image of the existing town center from the north (Clintwood Hwy).



Fig. 47: Author's own. Collage photo of approach to the hiking hub.

The hiking hub building is intended as something to catch the eye and pique the curiosity of people arriving from the north entrance to town. The program is for a nature center on the bottom and a mini flagship hiking gear store up top, intending to fill a regional program gap and attract tourism. It also acts as a gateway to draw people down into the riverwalk system behind it. If one enters through the front, they may choose to cross the first floor to enter the amphitheater, or they would be drawn up to the retail floors by the triple height stair to the left and the warm glow of the timber ceiling that is symbolic of the area's natural context.

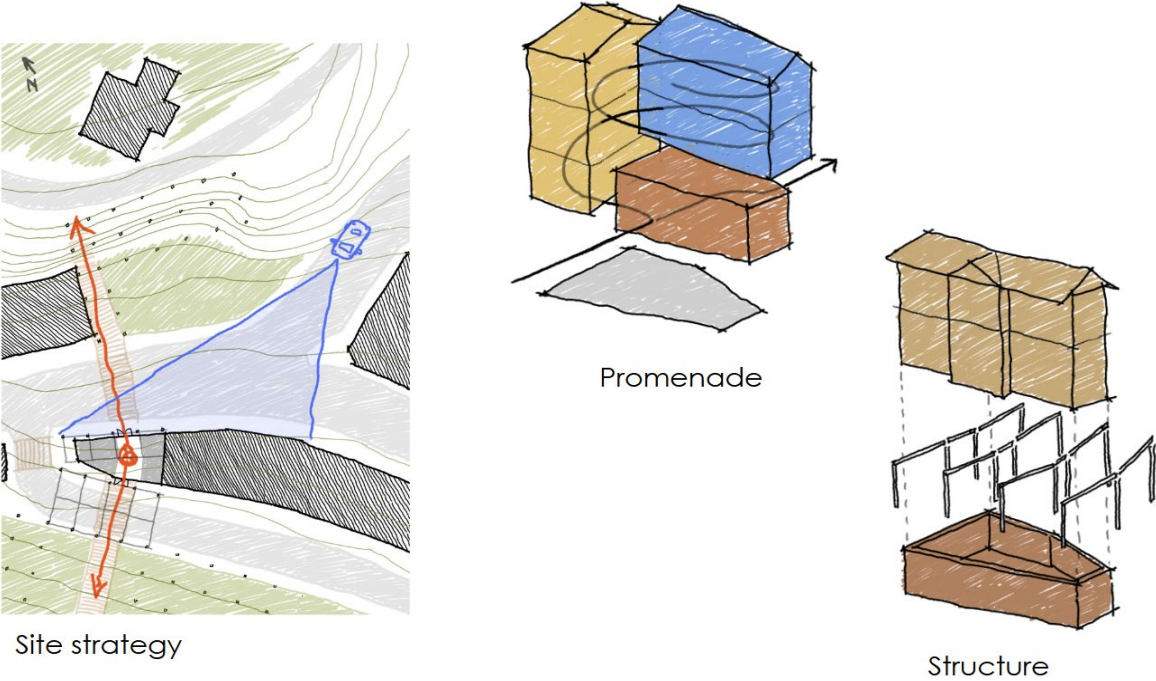


Fig. 48: Author's own. Diagrams describing site strategy, promenade through different spaces, and structural strategy of the hiking hub.

The missing teeth typology that this tangles with is a short building with new floors added on top, a type of adaptive reuse termed “vertical addition”. The grid that extends over the town acts as a totally separate structure to bear the load of the upper floors so they don't need to depend solely on the original building's structural integrity.



Fig. 49: Author's own. Section perspective of hiking hub interior showing first floor nature center and second and third floor retail space.

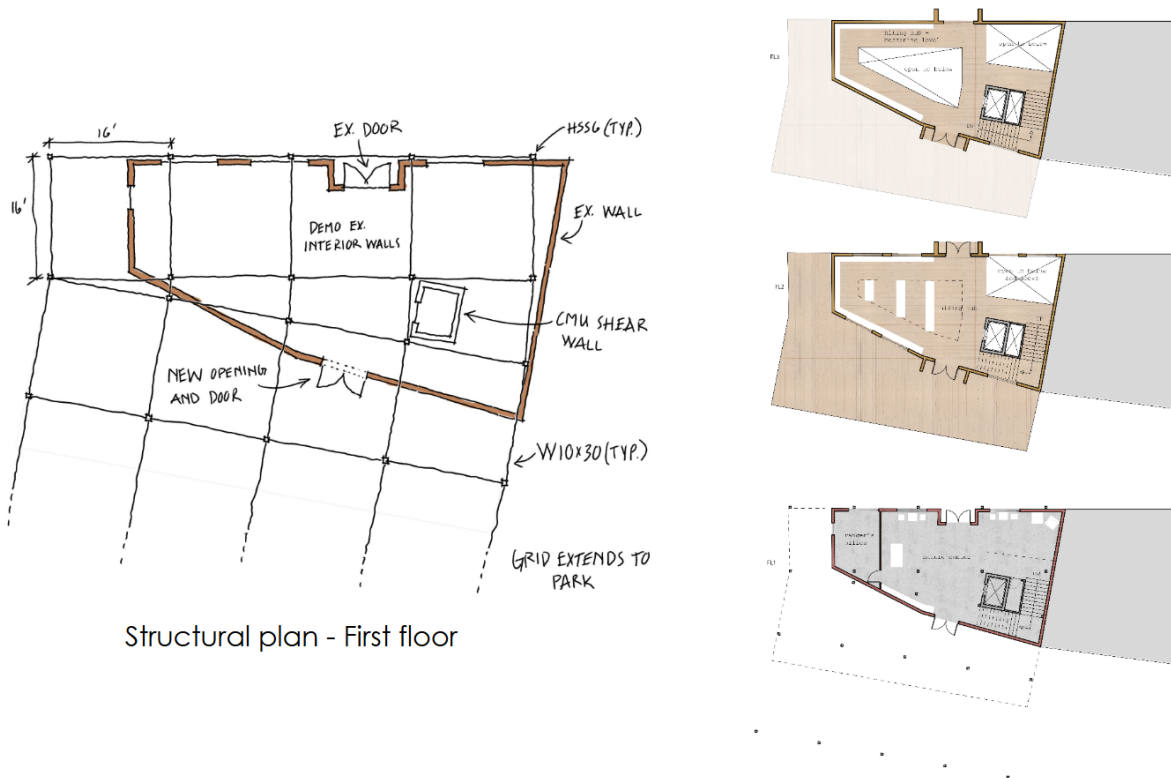


Fig. 50: Author's own. Plans and structure diagram of the hiking hub.

Section 3: The Library



Fig. 51: Google Maps image and author's own image of the existing conditions of "the old theater".

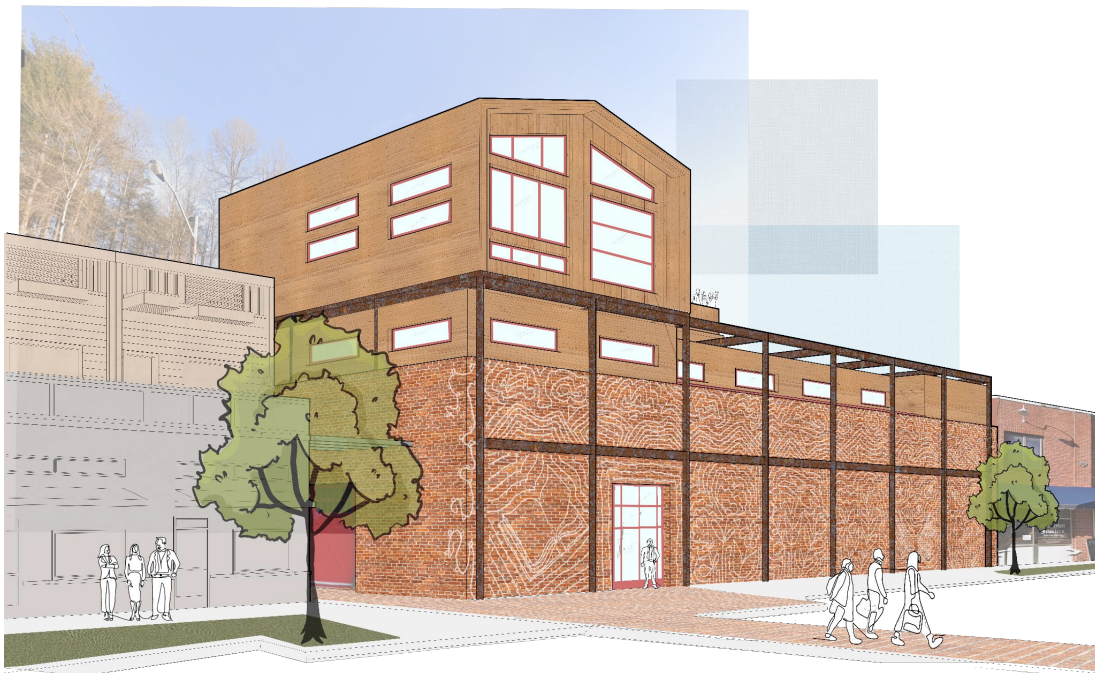


Fig. 52: Author's own. Street perspective of the library.

The library is sited in a roofless structure known by residents as “the old theater”, turning an old community hub into a new one. It acts as a medium term retention strategy in that it benefits both residents of the town and of surrounding towns, as it is a third space for all ages. The form acts as a landmark building for the street, bringing the familiar residential typology of the gable into civic use - which is part of the language of the overall design - but the building is not as prominent from all entrances as the hiking hub is.

The program is for a large rentable indoor event space on the bottom floor for regional fairs and markets or perhaps the town’s local Red Fox Storytelling festival, a small library on the second floor including a lending library for tools and household appliances that supports the Appalachian culture of self-sufficiency, and a coworking space and cafe on the top floor that intends to act as a work space for remote employees and maybe convince them to stay long term.

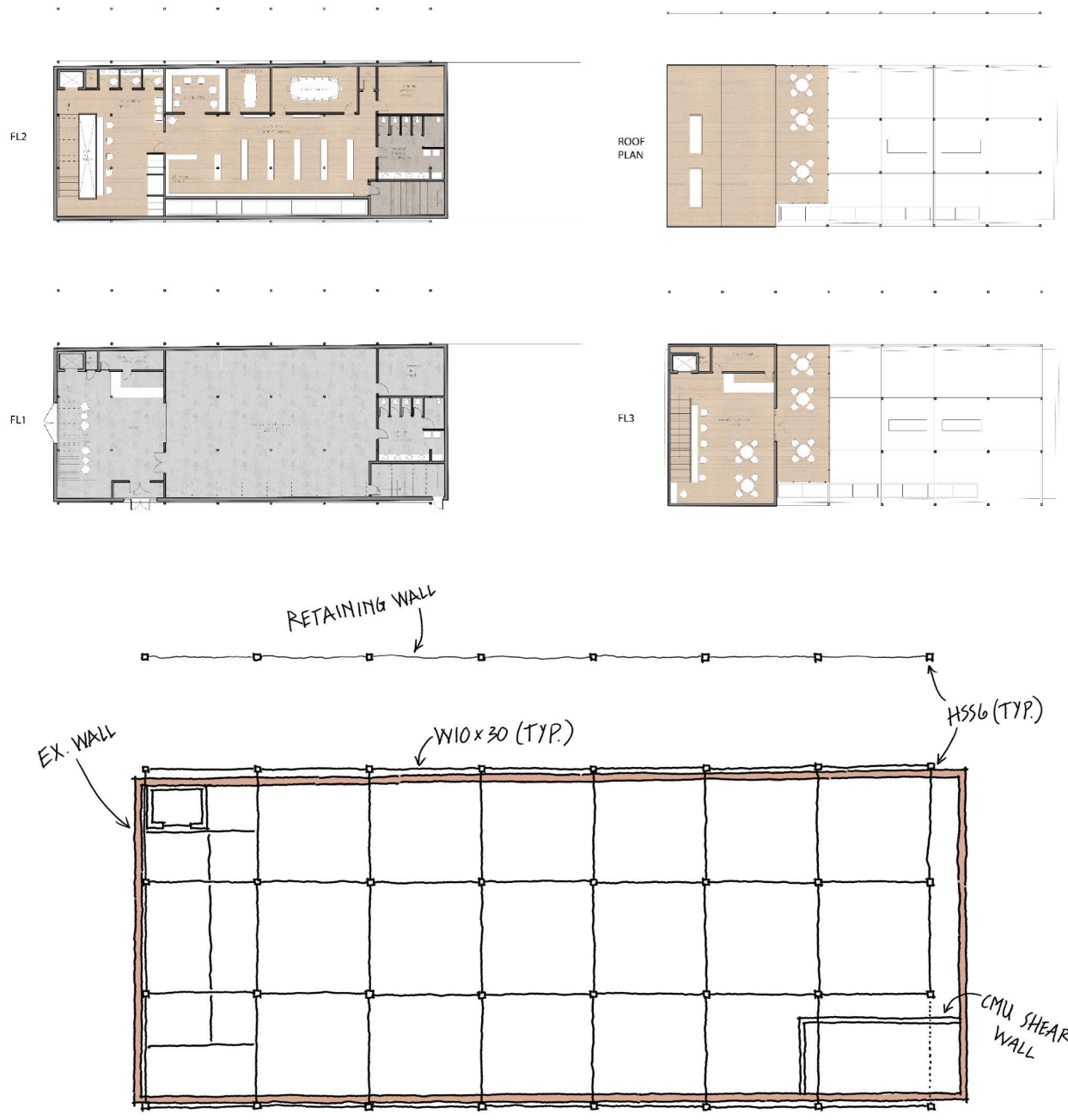


Fig. 53: Author's own. Plans and structure diagram of the library.

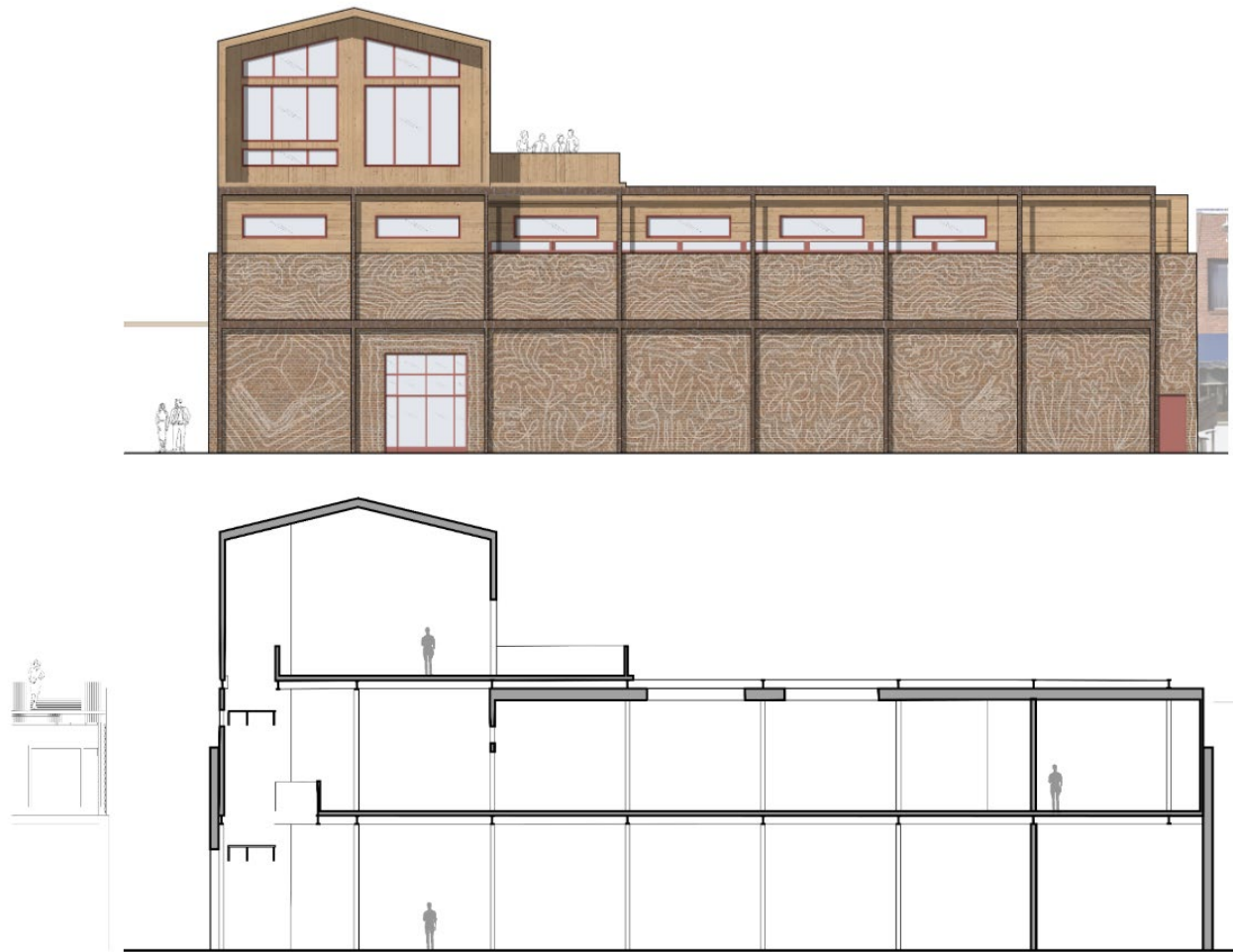


Fig. 54: Author's own. Front elevation and longitudinal section of the library.

The existing walls are preserved with as few amendments as possible, and they provide opportunity for a mural. The grid structure once again acts as a stabilizing feature and supports the weight of the new floors as well as being a facade element. The existing door on the side can be opened on nice days to create passive ventilation in conjunction with operable skylights, and the south-facing front elevation provides hours of natural light and the ability to partially light the event space below.



Fig. 55: Author's own. Climate strategies diagram showing passive ventilation via the skylights and existing side door.

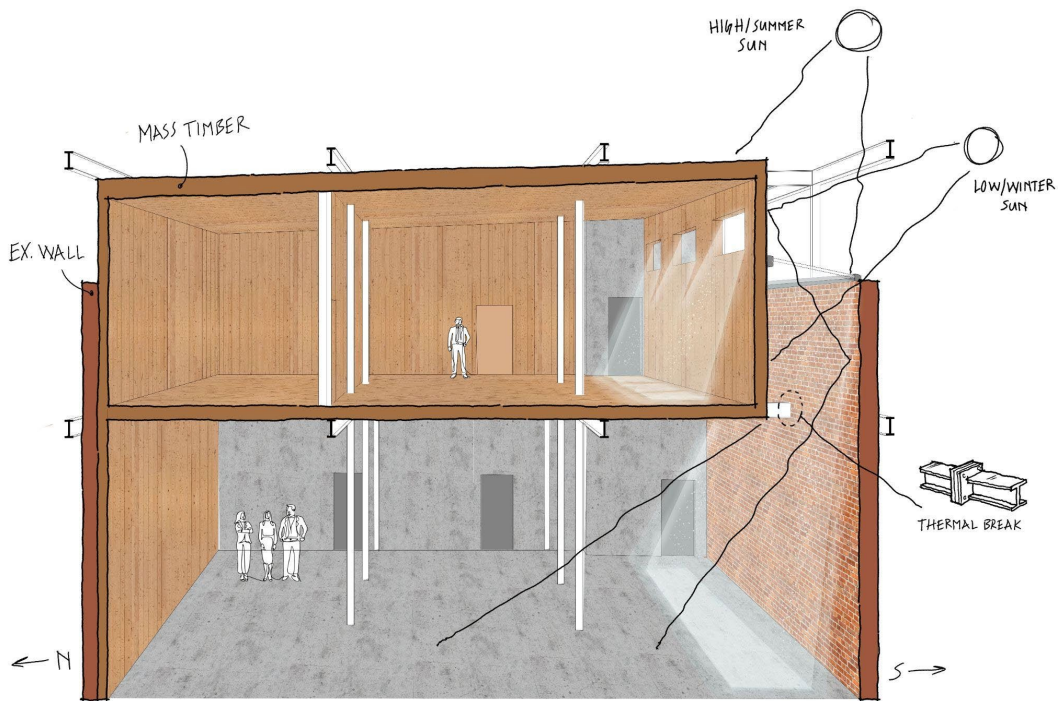


Fig. 56: Author's own. Transverse section illustrating light, materiality, and structural detail.

Section 4: The Module

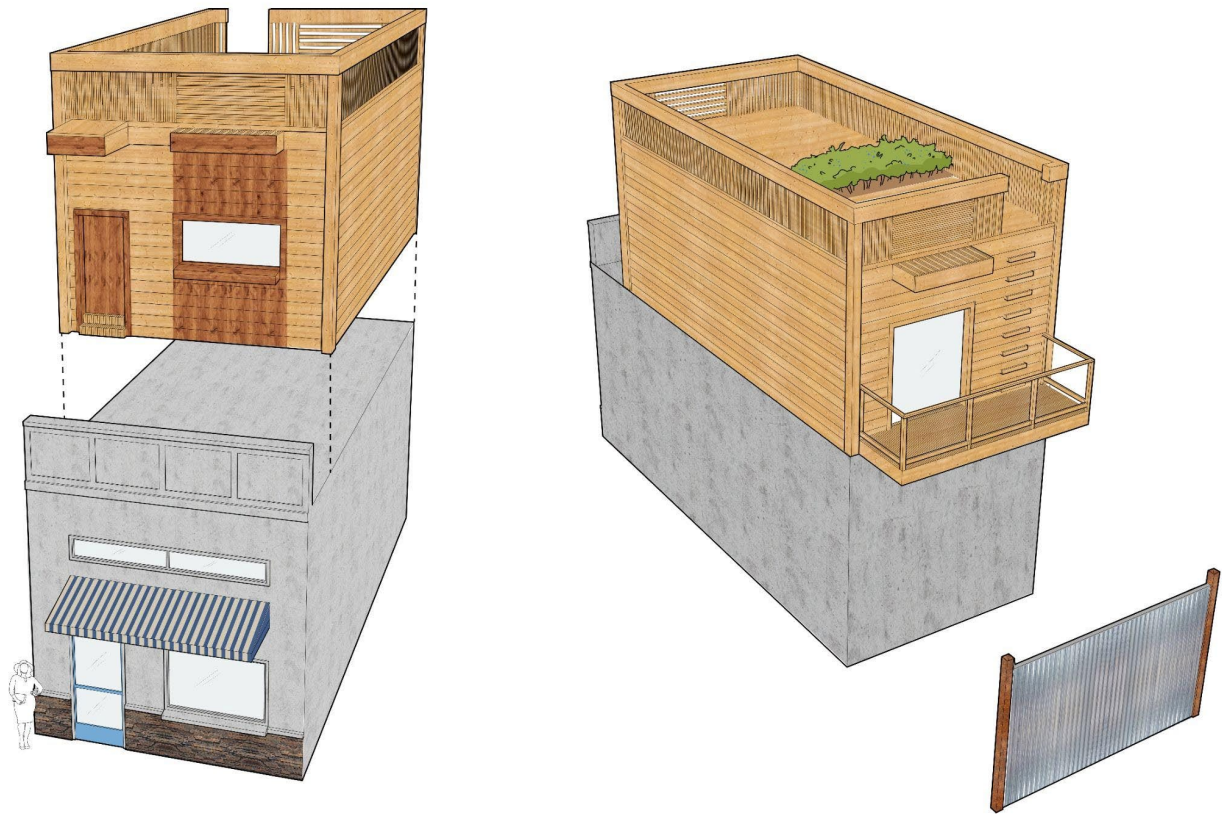


Fig. 57: Author's own. Axonometric drawings of modular housing units and concrete bases.

The third focus building is a mass timber housing module, intending to provide housing for longer term residents. Its target audience is young adults around ages 18-24 in order to try and retain some of that demographic. It also could house short- or medium-term residents who move to town as tourists.



Fig. 58: Author's own. Front elevation and transverse section of the timber module and concrete base.

It comes in two sizes, a studio apartment and a 2 bedroom apartment. It is designed to be prefabricate-able and installed on top of the small business blocks in the Town Square on an as-needed basis, spreading out the costs over a longer term. The panels are of dowel laminated mass timber, constructed of 2x4" and 2x12" dimensional lumber only, and then outfitted with siding and interior finishes to preference.



Fig. 59: Author's own. Plans, sections, elevations for the timber housing module, both sizes.

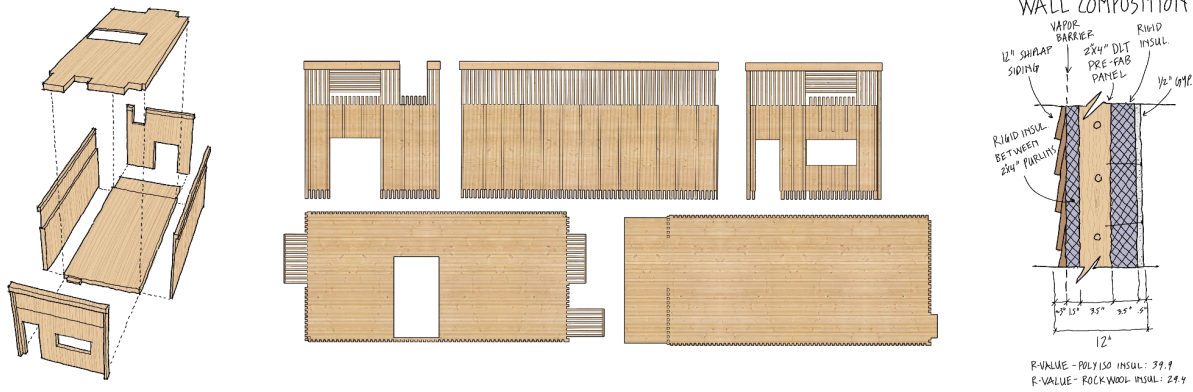


Fig. 60: Author's own. Structure diagram for the timber housing module.

The finished wall assembly can meet PassiveHaus standards for R value depending on the insulation type. The choice of mass timber is also deliberate: since it's an emerging building technology in the US with emerging demand, it might pair well with the fact that the region has large timber resources managed using sustainable forestry and many local sawmills - mass timber production has a long term possibility to start to become a region-wide industry, helping to lessen the effects of the gap the coal industry is leaving - the largest missing tooth of all. This module creates a small and flexible product demand to encourage local sawmills to invest in the technology, where they could then produce products for other projects in other cities.

Section 5: Places



Fig. 61: Author's own. Perspective collage of the Rescue Squad rec center tennis court.

Here are a few of my favorite places of the project: The tennis court is a non-habitable structure next to the existing rescue squad (that could also be used for pickleball), encouraging people of all ages to get outside for low impact community sports. The lot is currently rented to the adjacent auto shop so it is likely a longer term item.

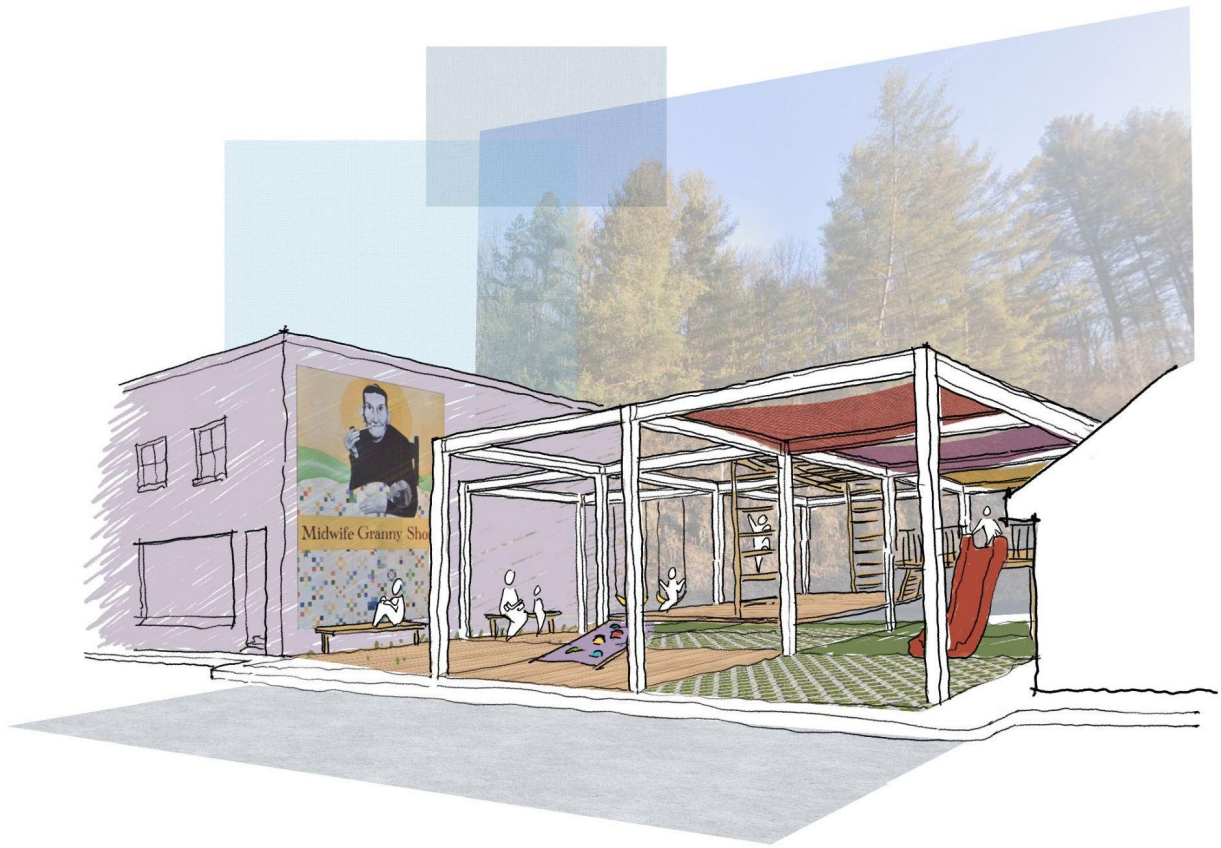


Fig. 62: Author's own. Perspective collage of Granny Shores park.

This is a new pocket park, primarily a children's playground, under the protective eye of a local historical figure. The quilt patches from the mural were all done by community members and are the inspiration for the quilt pattern motif scattered throughout the project.



Fig. 63: Author's own. Perspective collage of the Storytelling Park.

This is my proposal for the pocket park that's viewed from the east entrance of town - a space celebrating a tradition of oral history where visitors can listen to area residents tell the stories of the town and keep its history alive.



Fig. 64: Author's own. Perspective collage of the main shopping street corridor.

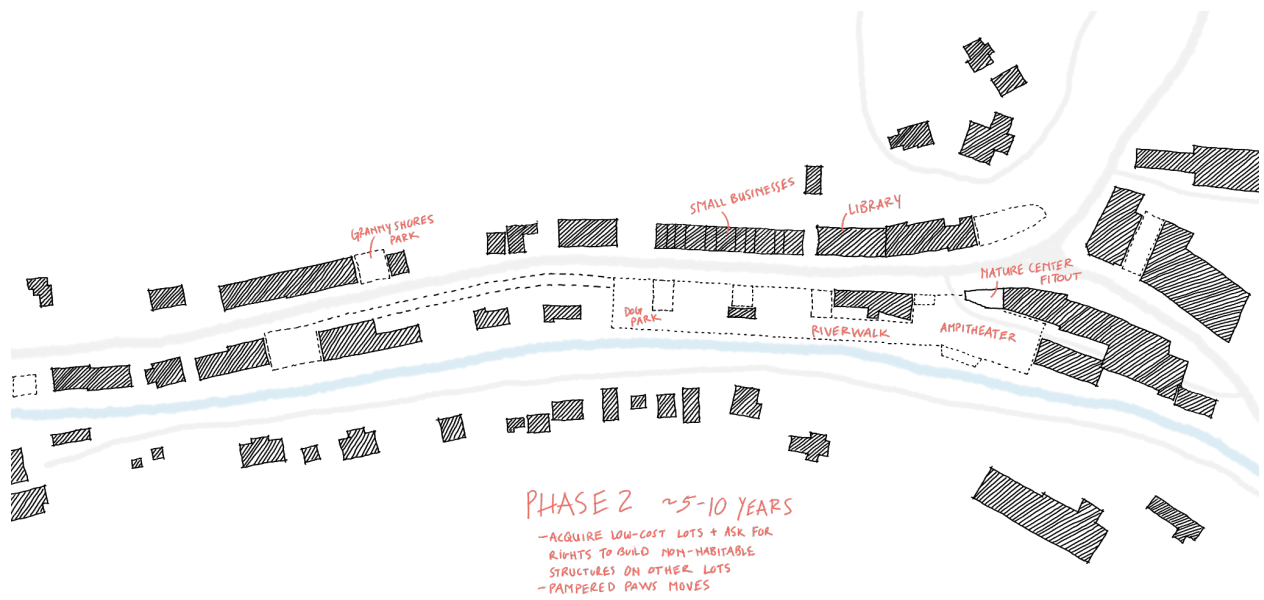
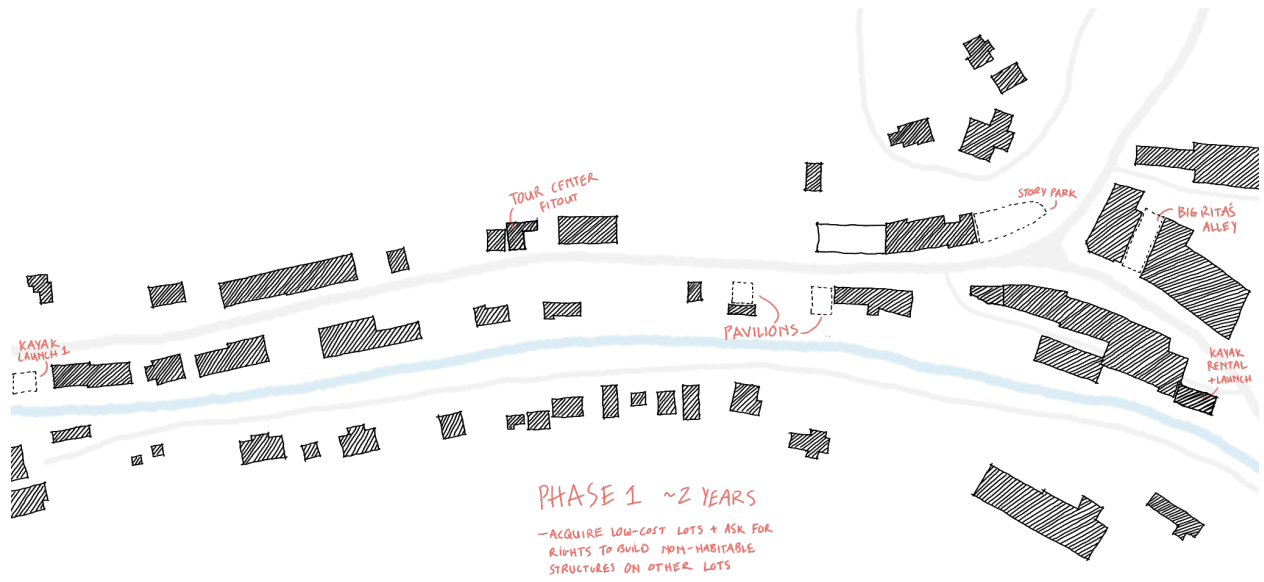
This is a primary view of the town square as entered from the west. The hiking hub can be viewed from here as a central point. The grid structure of the park to the south holds the southern street edge, despite being a non-habitable structure. The “porch” structures act as the access points to the residential modules above and also provide a semi-private community gathering place for those residents. They also call back to “porch culture” of being able to sit on your porch and get eyes on the street, a large factor in increasing community investment.

Section 6: Conclusion

I've greatly enjoyed working on this project and am proud of the result. It taught me more than just design and I feel like it prepared me for other aspects of my future career that I hope to use again someday.

One challenge was that of scope creep; even though I intentionally chose a town with a small enough urban condition that it could be handled by one person in the allotted time, there was still the question of the extents of the urban intervention. How far down the street should it go? How far up the hill, how far down to the river? There will always be more work to do, but for the purpose of this project the work stayed mostly between the river and the hill.

Another challenge related to the project was getting to blur the lines between real work and school work. Having to navigate the demands of a M.Arch thesis but respect the desires of the town was a new skill. As a result, the design itself is not only flexible but I've developed a loose phasing plan based on real world constraints as to what is most actionable for the town in the short term, should they choose it. While the thesis defense and presentation focused on the 20 year vision, I plan to meet with the town to discuss their more actionable short term possibilities and what sorts of things could set them up for success further afield.



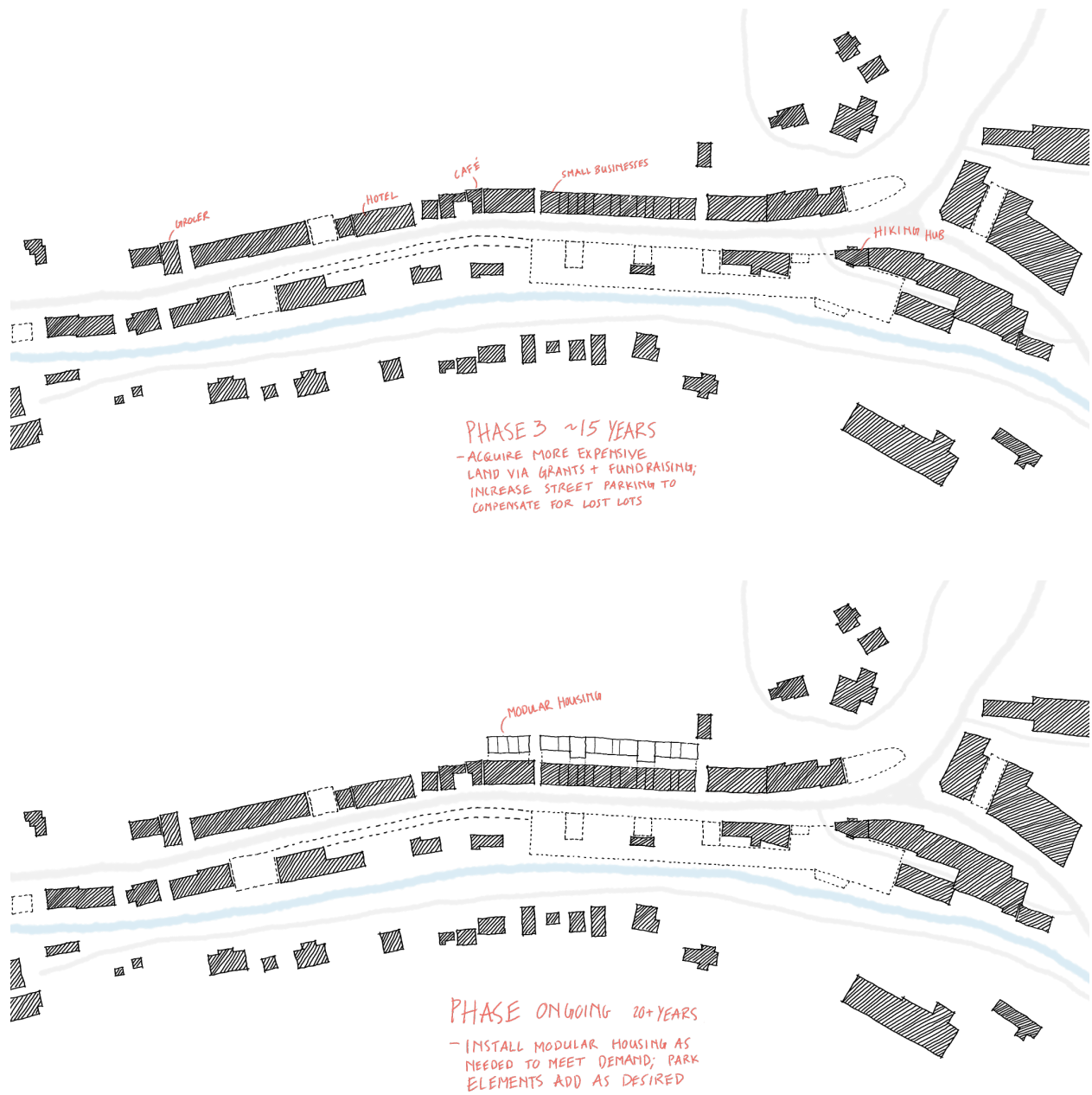


Fig. 65: Author's own. Phasing diagram shown through figure ground series.

And one more thing: I actually got to visit Pound over spring break had a wonderful time meeting people and gathering site data. I hope they like some of the ideas and I hope I'll get the chance to come back again.



Fig. 66: Author's own photos. Author visiting Natural Tunnel State Park and Pound, Virginia.

While the Missing Teeth theory can be applied generally to towns and cities experiencing urban decline, it also needs to be highly site-specific in order to be successful. Without this, designs are in danger of not being used, gentrifying an area, or driving people further from it. In the case of Pound, the town could cease to exist if not enough factors are considered. The design for the town of Pound responds to both the needs of the existing residents and helps welcome future ones. It respects the past and dreams for the future while protecting the natural context and building stock that is present.

Appendix A

Site selection process - the letter I sent to around 12 communities and organizations.

Hello,

I'm a graduate student in architecture starting my thesis year and have had the pleasure of doing summer home repair work in central and southern Appalachia since 2014. I am continually inspired by the deep connection communities have to the land and each other, and for this reason I'm interested in siting my thesis project in the region.

This architectural thesis asks the question "how can we better build to support communities?", and touches on gentrification and community-led design. The working theory is that building in "gaps" such as a vacant lot, empty building, or parking lot, can be more sensitive to community needs than the traditional "raze and rebuild" model of development since it doesn't remove existing resources. I've attached my visual proposal for your reference.

I am interested in talking to a small group of individuals who are able to represent the town's history and future desires, such as a planning commission, historical society, or other such community group. The planned result is a (theoretical) building design that intends to fill a gap that was collectively identified by the community. Examples could include a rec center, brewery, housing complex, urban farm, or any combination. Deliverables often include renderings and building documentation drawings such as plans and sections. After the project concludes, all ideas are yours to decide if they have a place in your city's future.

The project would conclude by May 2025 when I graduate with my degree, so a six month timeline. The commitment is fairly minimal: a few virtual chats via phone or zoom to include:

- an initial meet and greet (Nov/Dec 2024)
- a mid-project check-in (Feb/March 2025)
- and hopefully a final presentation (May 2025)

If welcome, I would love to come visit in person!

I thought it would be silly to investigate this question without talking to an actual community, so I was wondering if you would be interested in working with me if you feel you are a good representative of your community. If not, I'd appreciate if you'd put me in contact with the appropriate group!

Thanks for your time,

Hannah Gross

M.Arch Candidate

University of Maryland, College Park

Appendix B

Site selection process - the interview questions I did with Pound VA and Hazard KY.

Intro:

Q: What do you do? What is your story? (if group, each person)

Q: Who lives here? Ages, backgrounds. What are their specific needs?

Q: Can you tell me about your town's history? What are the highlights? What are the specific traumas that might affect rebuilding?

Program:

Q: What's your opinion of your main street? Why?

Q: What is the major industry in your town/area? Does the town/area produce anything?

Q: What do you not have? What places/spaces/buildings business do you wish you had?

Q: Do you have enough housing?

Q: Do you have enough green space?

Q: Does your infrastructure (transit, energy) support your town's needs? How do resources arrive (i.e. trucks, trains)?

Q: Where do people go when they're not at home or not at school/work?

More "technical":

Q: What do you know about zoning/restrictions on building in your area? i.e. floodplain?

Q: Who owns buildings/majority of buildings in your main street?

Concluding:

Q: Where do you envision your town in 5 years? 10? 20?

Bibliography

- 3 people not yet located after flooding in Buchanan County, Va. - The Washington Post. Accessed December 18, 2024.
<https://www.washingtonpost.com/dc-md-va/2022/07/13/residents-missing-flood-virginia-buchanan/>.
- Bureau, United States Census. "Populations and People." Pound town, Virginia. Accessed December 17, 2024.
https://data.census.gov/profile/Pound_town,_Virginia?g=160XX00US5164272#populations-and-people.
- Caoui, El Hadi, Brett Hollenbeck, and Matthew Osborne. "The Impact of Dollar Store Expansion on Local Market Structure and Food Access," 2479th ed., 2023. <https://doi.org/10.22004/ag.econ.329683>.
- Carter, Majora. *Reclaiming Your Community: You Don't Have to Move out of Your Neighborhood to Live in a Better One*. National Geographic Books, 2022.
- "City and Borough Data." State of the City 2019. Accessed December 17, 2024.
<https://furmancenter.org/stateofthecity/view/citywide-and-borough-data>.
- Clubb, Michael. *A house that was moved off of its foundation rests among debris and mud, Thursday, July 14, 2022 in Whitewood, Va.* July 14, 2022. *WSLS.Com*. <https://www.wsls.com/news/national/2022/07/14/crews-still-searching-for-17-people-after-virginia-flooding/>.

- Crary, Duncan. *The KunstlerCast : Conversations with James Howard Kunstler*.
La Vergne: New Society Publishers, Limited, 2011. Accessed December
12, 2024. ProQuest Ebook Central.
- Ellingvag, Orjan F. *A mountaintop removal coal mine in West Virginia. Bad Rock:
How Mountaintop Removal Mining Can Damage Streams*. Time,
December 14, 2011. [https://science.time.com/2011/12/14/how-
mountaintop-removal-mining-can-damage-streams/](https://science.time.com/2011/12/14/how-mountaintop-removal-mining-can-damage-streams/).
- Engle, Elyzabeth W. “Coal Is in Our Food, Coal Is in Our Blood’: Everyday
Environmental Injustices of Rural Community Gardening in Central
Appalachia.” *Local Environment* 24, no. 8 (2019): 746–61.
<https://doi.org/10.1080/13549839.2019.1640668>.
- “Flood Protection and Prevention - - Tips and Solution.” firststreet.org. Accessed
December 17, 2024.
<https://firststreet.org/solutions/flood#communitysolutions>.
- Fugate, Ariel. “From Boarded Up to Bustling: Another Hazard, KY Building
Renovated.” *Mountain Association*. June 18, 2024.
[https://mtassociation.org/lending/boarded-up-to-bustling-dawhares-
hazard-ky-building-renovated/](https://mtassociation.org/lending/boarded-up-to-bustling-dawhares-hazard-ky-building-renovated/).
- Harrington, Christina, Sheena Erete, and Anne Marie Piper. “Deconstructing
Community-Based Collaborative Design: Towards More Equitable
Participatory Design Engagements.” *Proc. ACM Hum.-Comput. Interact.* 3,
no. CSCW (November 2019). <https://doi.org/10.1145/3359318>.
- Hobhouse, Jack, and Alyn Griffiths. *View of facade of 141-145 Curtain Rd.* .

Duggan Morris Injects New Life into Georgian Office Block in Shoreditch with Metal Mesh. dezeen, March 24, 2014.

<https://www.dezeen.com/2014/03/24/curtain-road-office-renovation-extension-duggan-morris-architects/>.

Income and poverty in Appalachia, July 2, 2024. <https://www.arc.gov/about-the-appalachian-region/the-chartbook/income-and-poverty-in-appalachia/>.

Keefe, Susan Emley. "Urbanism Reconsidered: A Southern Appalachian Perspective." *City & Society* 7, no. 1 (1994): 20–34.

<https://doi.org/10.1525/ciso.1994.7.1.20>.

Keeling, Jeff. "Pound, Va. Home Blocked by Coal Mine Runoff ." WJHL | Tri-Cities News & Weather, June 23, 2022.

<https://www.wjhl.com/news/local/pound-va-home-blocked-by-coal-mine-runoff/>.

Klesta, Matt. "Resilience and Recovery: Insights from the July 2022 Eastern Kentucky Flood." Community Development Reports, September 27, 2023.

<https://www.clevelandfed.org/publications/cd-reports/2023/20230927-resilience-and-recovery>.

Lewis, Seth M. *Photo of Hazard's downtown in winter. Odyssey.* Berea College, October 17, 2016.

Levine, M. *Broken Windows, Broken Business: The Revolutionary Broken Windows Theory: How the Smallest Remedies Reap the Biggest*

Rewards. Grand Central Publishing, 2021.

<https://books.google.com/books?id=nJfvDwAAQBAJ>.

- Liu, Yuqi, Yingqi Guo, Shiyu Lu, On Fung Chan, Cheryl Hiu Kwan Chui, Hung Chak Ho, Yimeng Song, et al. "Understanding the Long-Term Effects of Public Open Space on Older Adults' Functional Ability and Mental Health." *Building and Environment* 234 (2023): 110126.
<https://doi.org/10.1016/j.buildenv.2023.110126>.
- "Missing Teeth." West Philadelphia Landscape Project, September 28, 1997.
<https://web.mit.edu/wplp/plan/misst.htm>.
- Mueller, Caroline. "Downtown Hazard Sees Growth as Several Businesses Expand." <https://www.wymt.com>, August 12, 2024.
<https://www.wymt.com/2024/08/12/downtown-hazard-sees-growth-several-businesses-expand/>.
- Murthy, Vivek Hallegere. *Together : The Healing Power of Human Connection in a Sometimes Lonely World*. First edition. New York, NY: Harper Wave, an imprint of HarperCollins, 2020. Accessed September 2, 2024.
<https://www.overdrive.com/search?q=A42CF4B3-6D95-4FB6-9F51-D7C37C41E557>.
- National Weather Service Offices Blacksburg, VA and Charleston. "Southwest Virginia Flooding: July 2022." ArcGIS StoryMaps, October 12, 2022.
<https://storymaps.arcgis.com/stories/fcb54c51bde7480da7f065844626c62b>.
- "New APA Poll: One in Three Americans Feels Lonely Every Week." *NASDAQ OMX's News Release Distribution Channel*, 2024.

Oldenburg, Ray. *The Great Good Place : Cafés, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*. New York: Marlowe, 1999.

Population and age in Appalachia, June 26, 2024. <https://www.arc.gov/about-the-appalachian-region/the-chartbook/appalachias-population/#:~:text=Appalachia%20had%20a%20population%20of,trends%20through%20the%20charts%20below>.

“Pound Origin.” The Origin of the Town of Pound, 2021. <https://phs1.org/pound-origin.htm>.

“Pound, VA.” Data USA. Accessed December 17, 2024. <https://datausa.io/profile/geo/pound-va>.

Sayin, Eda, Aradhna Krishna, Caroline Ardelet, Gwenaëlle Briand Decré, and Alain Goudey. “‘Sound and Safe’: The Effect of Ambient Sound on the Perceived Safety of Public Spaces.” *International Journal of Research in Marketing* 32, no. 4 (2015): 343–53. <https://doi.org/10.1016/j.ijresmar.2015.06.002>.

Schneider, Gregory S. Town of pound emerges from its death sentence in VA. General Assembly - The Washington Post, February 2, 2023. <https://www.washingtonpost.com/dc-md-va/2023/02/02/virginia-town-pound-general-assembly/>.

Sheriff’s Office, Wise County. *Flooding in Pound, Va.* . NBC 8 News. WRIC, July 28, 2022. <https://www.wric.com/news/virginia-news/photos-flooding-in-southwest-virginia-town-leads-to-evacuations/>.

“The Coal Fields.” Virginia’s Coal Towns, October 27, 2001.

<https://www.lva.virginia.gov/exhibits/coaltown/fields/#:~:text=After%20the%20Civil%20War%2C%20rail,lines%20through%20Tazewell%20to%20Norton.>

Wolch, Jennifer R., Jason Byrne, and Joshua P. Newell. “Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities ‘Just Green Enough.’” *Landscape and Urban Planning* 125 (2014): 234–44. <https://doi.org/10.1016/j.landurbplan.2014.01.017>.

“VDOT Bidirectional Traffic Volume.” Map Viewer, 2022.

[https://www.arcgis.com/apps/mapviewer/index.html?layers=a8da35dd9ce54993b25f64487c3717ec.](https://www.arcgis.com/apps/mapviewer/index.html?layers=a8da35dd9ce54993b25f64487c3717ec)