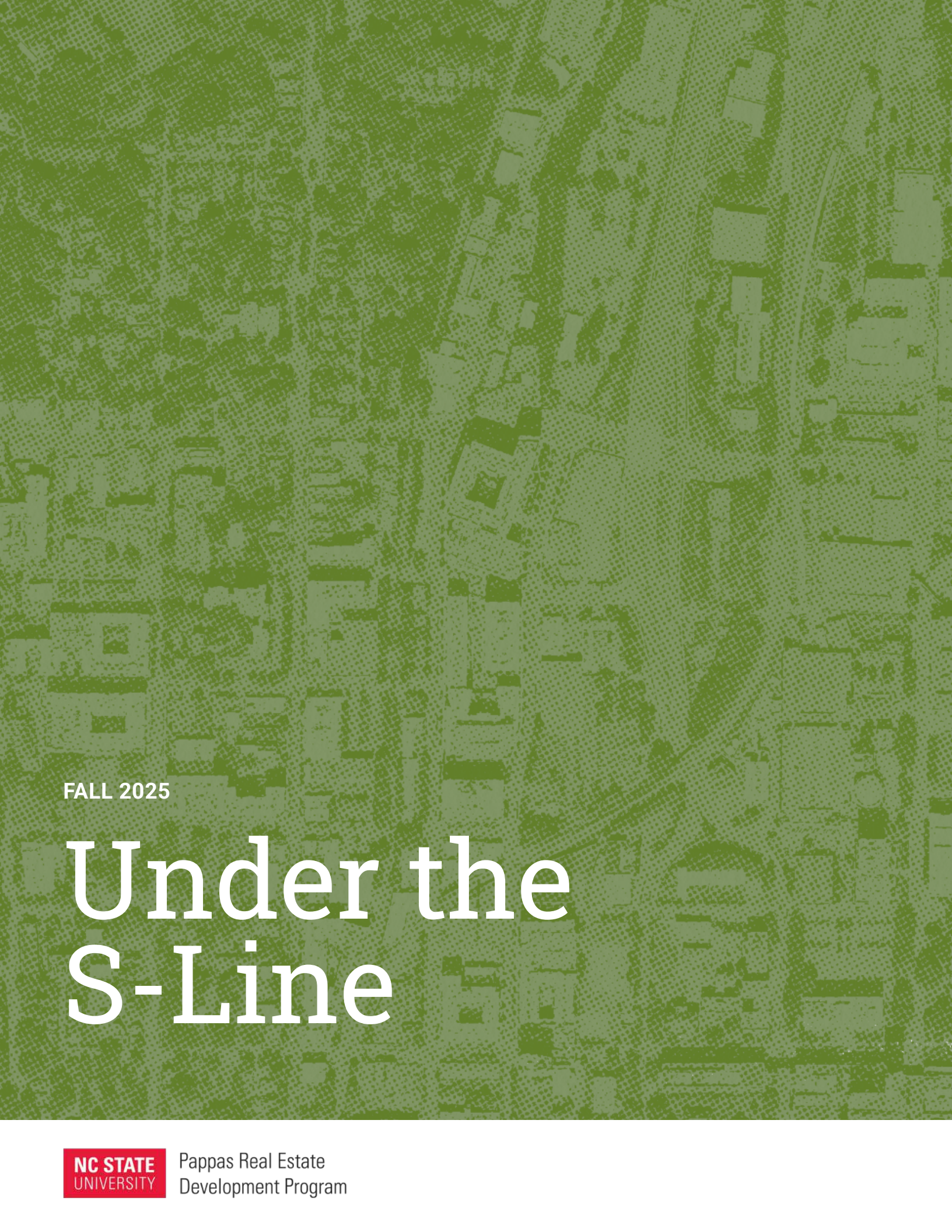


An aerial photograph of a city grid, likely Raleigh, North Carolina, showing streets and building footprints. The image is overlaid with a semi-transparent green filter and a fine halftone dot pattern.

FALL 2025

Under the S-Line

This study was sponsored by Downtown Raleigh Alliance (DRA), with additional support from the City of Raleigh, Urban Projects Group. The DRA played a vital role in ensuring that the study remained aligned with the City’s long-term goals and that its outcomes would inform future planning and design efforts for the S-Line area. Serving as both a resource and liaison, the DRA helped to build working relationships between the graduate research team, City departments, NCDOT personnel, and local partners and stakeholders. These working relationships were essential to the project’s success, helping to ensure that the graduate research associate’s values and visions aligned with those of the community and its stakeholders. Additionally, the DRA hosted and coordinated both stakeholder engagement events. Overall, the partnership with the DRA played a pivotal role in bridging academic research and real-world implementation, ensuring that the study reflected stakeholder’s vision for future growth.

SPONSORED RESEARCH TEAM

This research is hosted by the Pappas Program for Real Estate Development and features the work of a master’s student, now a graduate, from the College of Design’s Landscape Architecture program. This study represents a win-win scenario where the student was mentored and able to apply academic theory to a real-world project, while providing a meaningful service to North Carolina communities, specifically the City of Raleigh, its residents, and future visitors. This, and other research studies within the Pappas Real Estate program, embody the “Think and Do” motto of NC State University and its fundamental role as a land-grant institution serving all 100 counties.



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Pappas Real Estate
Development Program

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Scope and Need

Study Scope

The future S-Line in downtown Raleigh presents a critical choice: will the space beneath the elevated rail become a neglected, fenced-off “no man’s land,” or will it be transformed into a vibrant public asset? The elevated railway portion of the S-Line begins just north of West North Street and returns to grade at West Peace Street, spanning roughly three city blocks through the heart of downtown. This shift in grade creates unique spaces beneath the railway, as well as areas between the railroad and the street right of way, that, without thoughtful planning, risk becoming underused and disconnected from surrounding activity. Our design focus lies in the parcel just south of where the grade change begins at West North Street, a location that sits at the threshold of this elevated zone.

This project is a proactive response to that challenge. We believe that design has the power to turn what could otherwise become a forgotten infrastructural gap, a nuisance and security concern, into a lively, thriving space for people and nature. By prioritizing this area beneath and alongside the elevated rail, we aim to demonstrate how careful design and programming can act as relvelator. Sparking a vibrant public realm that enhances the quality of life for locals and visitors alike. The goal of this scope of work and comprehensive booklet is to provide city stakeholders with a resource that inspires collaboration and guides the future activation of this important downtown corridor.



SCOPE OF WORK

Task 1.0. - Inventory + Analysis

Gather Existing Data: Gather existing data on the proposed railway route and the surrounding urban context.

Conduct Site Analysis: Conduct a thorough site analysis to identify opportunities, constraints, and potential uses for the underpass area.

Task 2.0. - Precedent Studies

Identify+ Analyze: Identify and analyze successful case studies of elevated railway underpasses worldwide.

Evaluate Design Strategies: Evaluate design strategies, programming, and public engagement approaches used in these projects.

Document: Document key findings and lessons learned.

Task 3.0. - Design Ideations

Develop Ideations: Develop ideations that can inspire and advocate for innovation uses of the space below the rail line. This iterative process produces a set a conceptual site design that reflects evidence-based design decisions.

Image - This image depicts what space under the railroad could become without a vision. Creating this vision is the purpose of this study.

What is the S-Line?

The S-Line, a historic former Seaboard Air Line Railroad corridor, is being developed for higher-speed and intercity passenger rail between Raleigh, NC, and Richmond, VA (R2R). This critical R2R segment, a partnership between NCDOT and the Virginia Rail Passenger Authority, connects into the larger Southeast High-Speed Rail network. The project will provide faster, more reliable passenger rail between the Triangle area and Virginia, and lay the foundation for future expansion toward Washington, D.C. Beyond modernizing the rail infrastructure for efficient travel and increased investment, the S-Line development will also enhance multimodal mobility, improve pedestrian safety (via bridges and overpasses), support economic growth, and advance active transportation networks and transit-oriented development.

RALEIGH TO RICHMOND

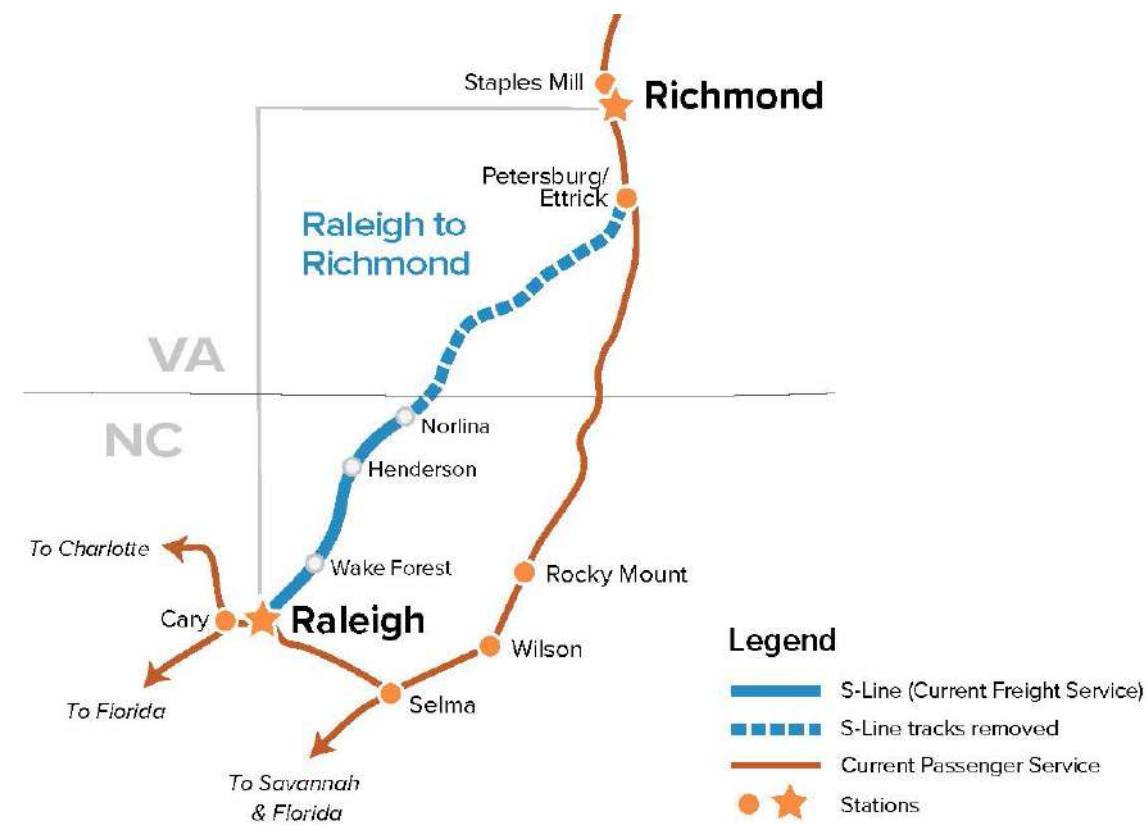


Image depicts the S-Line corridor from Raleigh to Richmond (North Carolina Department of Transportation, n.d.).

RALEIGH TO WAKE FOREST

An 18-mile section between downtown Raleigh and downtown Wake Forest has been funded by a \$1.09 billion federal grant, and construction is projected for 2027 to 2032, as outlined in the 'Raleigh to Wake Forest Timeline'. The grant will cover acquisition of right-of-way, new track construction, roadway grade separations, and platform expansion at Raleigh Union Station. In Wake Forest, funding will also support a new multimodal mobility hub and future passenger station near the town core, with planned connections to local transit, micromobility, and pedestrian and bicycle networks. This Raleigh-to-Wake Forest corridor represents the first step in establishing future rail service north toward Virginia, while also promoting walkable, transit-focused development in both communities.

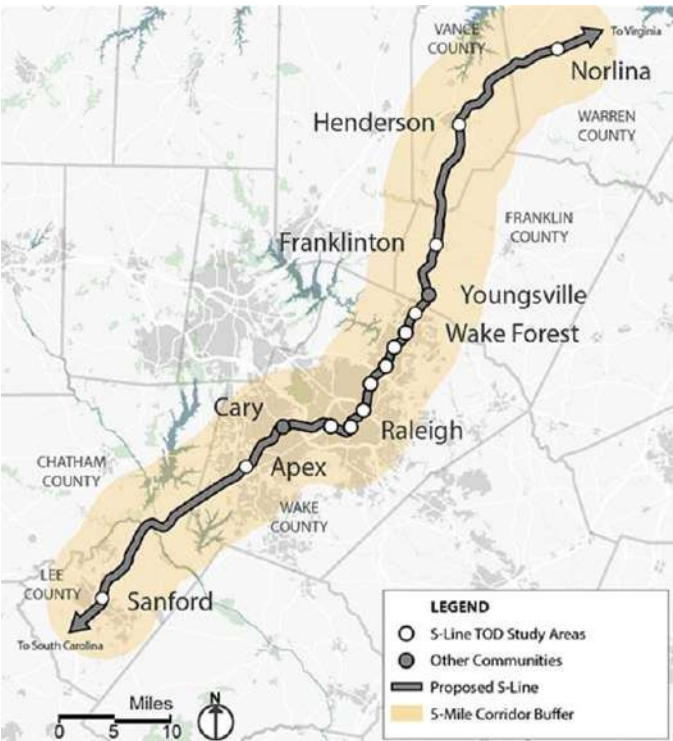


Image depicts the S-Line corridor from Downtown Raleigh to Downtown Wake Forest (Wake Forest, n.d.).



Image illustrates the timeline for the Raleigh-to-Richmond (R2R) S-Line project phases, including design development, Structural Analysis, Environmental Evaluation, Final Design, Right of Way acquisitions, and Construction (North Carolina Department of Transportation, n.d.).

Research Project Schedule and Stakeholders Involved

IMPORTANT DATES

Kick of Meeting

NC State and Downtown Raleigh Alliance (DRA) walked through Scope of Work (SOW).

NCDOT Introduction

NC State and DRA met with NCDOT to understand NCDOT rail project.

City of Raleigh Stormwater Introduction

NC State and DRA met with City of Raleigh
Stormwater to align vision and values for the
S-Line research project.

4/8

Mid-project Touchpoint

NC State and DRA met for touch point in advance of stakeholder meeting.

5/20

Stakeholder Event

Visioning exercise to help conceptualize the potential for the West Street corridor as part of the proposed S-line rail.

Project Touchpoint

NC State and DRA met for mid-project touch point in advance of stakeholder.

Preliminary Review

NC State met with NCDOT and AMTRAK for design feedback.

Community Reception + Final Presentation

NC State team presented the full compilation of their research efforts to a group of stakeholders

9/26

Comprehensive Design Package

NC State team delivered final design package.

Research Project Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Task 1.0. - Inventory + Analysis 									
Task 1.1 Gather existing data									
Task 1.2 Conduct site analysis									
Task 2.0. - Precedent Studies 									
Task 2.1 Identify + Analyze									
Task 2.2 Evaluate strategies									
Task 2.3 Document findings									
Task 3.0. - Design Ideations 									
Task 4.0. - Design Package 									

Site Inventory + Analysis

Site + Context

This project re-imagines the space beneath Raleigh’s future rail viaduct as a vibrant public realm — transforming what could become a fenced-off void into a connected active corridor that supports community life along North West Street.

This site sits at the intersection of two quickly growing districts: Smoky Hollow and Glenwood South. It is a highly transitional space, currently dominated by nightlife, with very limited recreation opportunities or accessible green space. The nearest park, Fred Fletcher, is more than four blocks away. While Smoky Hollow Park is planned, this site provides an opportunity to address a meaningful gap in public green space.

Many residents live within a two-block radius, including a high number of dog owners (personal observation), yet access to green space remains limited. The map in the next page shows more than 25 nightlife venues and highlights the 3,500 nearby residents in orange. As Raleigh continues to grow rapidly, activating this area could transform it into a key public asset for residents and their pets in the heart of northern downtown.

Within two blocks of the site, there are currently...





Physical Context

URBAN HEAT ISLAND

“In the United States, heat waves injure more people than all other natural disasters combined”

National Safety Council (NSC)

Urban Heat Island (UHI) effect is a significant challenge in Raleigh, contributing to higher temperatures and making outdoor spaces uncomfortable for residents. As illustrated by Image 1.0, urban areas with large amounts of impervious surfaces, like Durham to the west and Raleigh to the east, are most affected by UHI. Surfaces, such as concrete and asphalt, absorb and retain heat, exacerbating temperature increases in the urban environment as the planet continues to warm.

Our study area offers a unique opportunity to counteract these effects. The shade created by the viaduct could make it one of the most comfortable outdoor spaces in downtown Raleigh during summer months. By incorporating additional green space and vegetation, the design can help to further mitigate UHI impacts, and create a welcoming community space.

Image 1.1 shows a heat map from an NC State study conducted on a summer morning in downtown Raleigh. Lighter areas on the map correspond to area with more green space, such as Fred Fletcher Park. This demonstrates how vegetation significantly reduces the build up of heat. Our project site, located at the center of the map, currently retains a large amount of heat due to the concentration of impervious surfaces. This reaffirms the need to need to incorporate shade, greenery, and vegetation into the design to create a cooler, more comfortable public space that supports community use throughout the year.

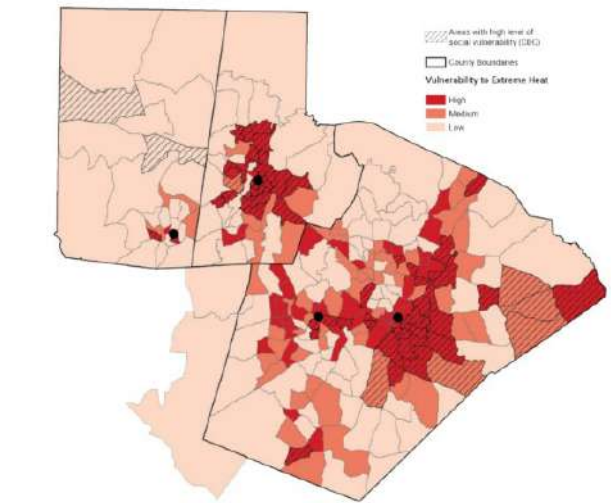


Image 1.0 - ‘Vulnerability to Extreme Heat’ (Source: Triangle Regional Resilience Assessment p.112).

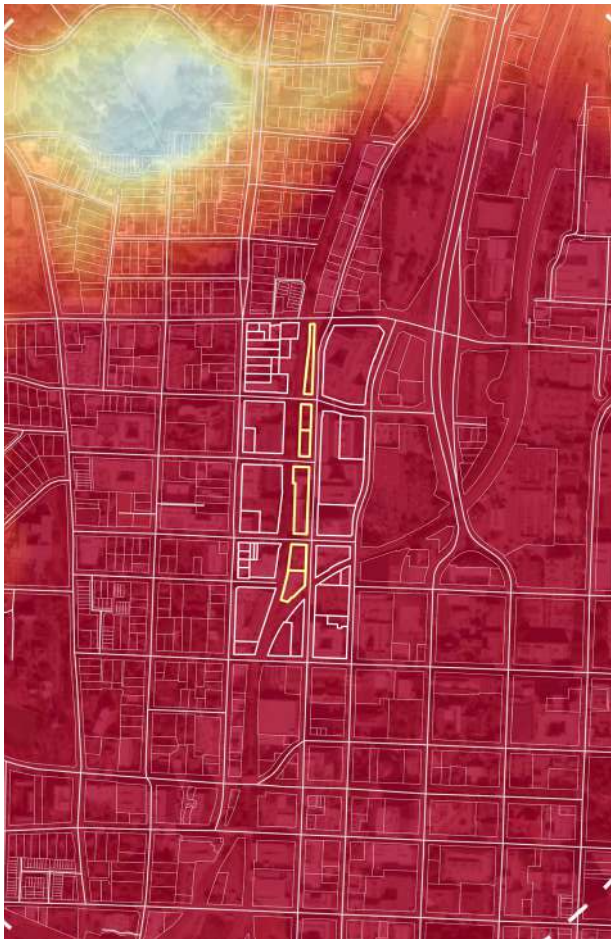


Image 1.1 - Morning heat map during summer month in 2021 from ‘Urban Heat Island Temperature Mapping Campaign, Raleigh and Durham 2021’, North Carolina State Climate Office.

The Urban Heat Island (UHI) effect isn't just a daytime concern, as illustrated by Image 1.2. It's impact extends into the night as well. As temperatures rise, impervious surfaces struggle to cool down, creating a cycle that intensifies the problem. These graphics highlight how these conditions are expected to worsen in the future, underscoring the urgent need for mitigation efforts. The S-Line project offers an opportunity to create cooler, more comfortable spaces for residents of Raleigh, helping to alleviate the effects of UHI and provide much-needed respite in the urban environment.

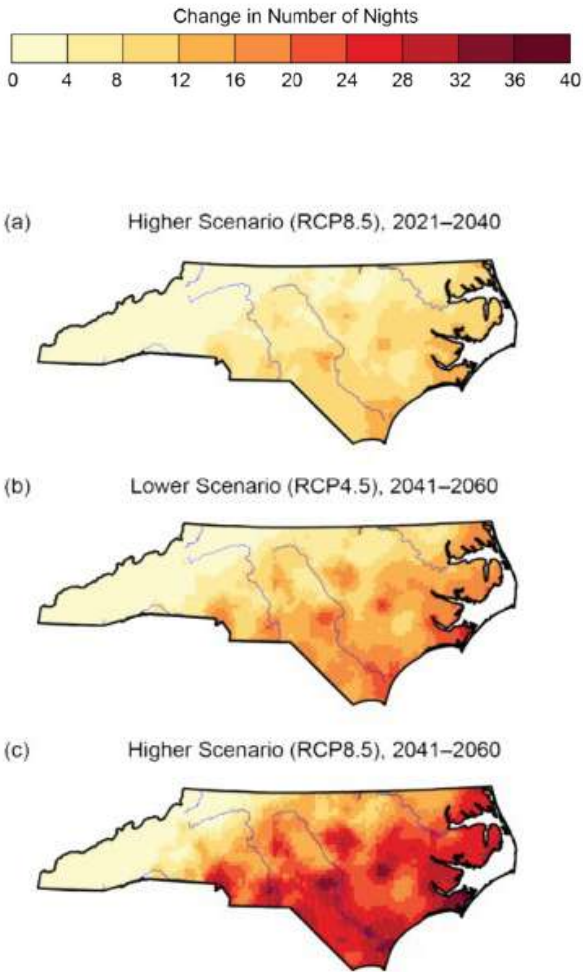


Image 1.2 - 'Projected Changes in Annual Number of Cold Nights', North Carolina State Climate Office.



Image 2.0 - Species diversity and number of observations for plants, spiders and insects, birds, and fungi within the site, based on citizen science data collected through iNaturalist. In total 61 observations and 44 species were recorded within the site boundaries.

PIGEON HOUSE BRANCH & WATERSHED HEALTH

The site includes a portion of daylight Pigeon House Branch — the only place in downtown Raleigh where this creek is exposed and visible. This presents a unique opportunity to celebrate the natural waterway, restore habitat, and enhance urban biodiversity. Improving the creek corridor not only supports watershed health but also brings biophilic design principles into the urban core, offering residents a connection to nature and a cool respite in the middle of a downtown core.

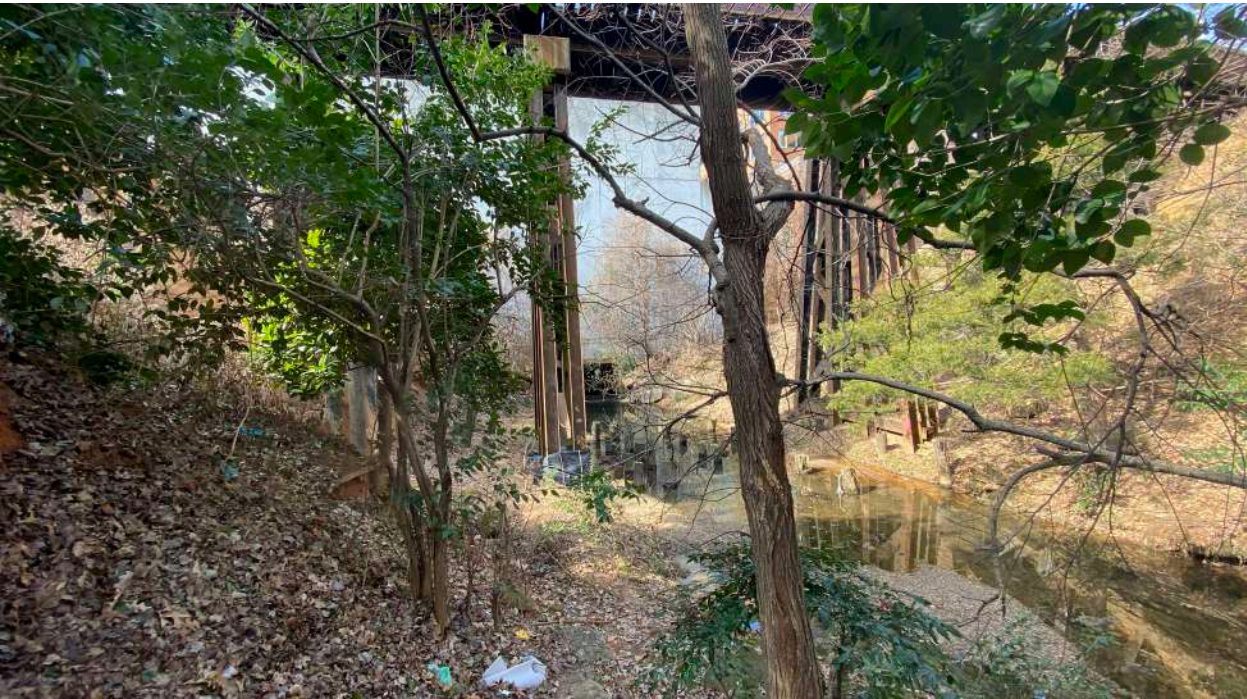
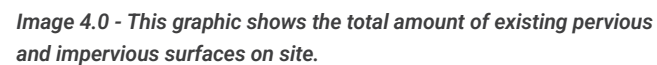
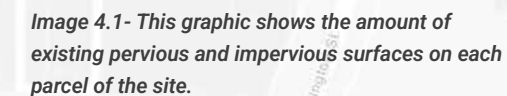


Image 3.0 - This image depicts a daylight portion of Pigeon House Branch that runs through the project site.

Currently, about 90% of the area within our scope of work is covered by impervious surfaces. This prevents water from infiltrating into the soil, causing most runoff to flow directly into stormwater inlets and into the Pigeon House Branch watershed without being filtered or cleaned. This contributes to water quality issues, flooding impacts, and missed opportunities for groundwater recharge. A key goal of our conceptual design is to increase pervious surface area to allow infiltration, slow runoff, and improve water quality.



We collaborated with the City of Raleigh's Stormwater Management team to ensure our goals align with the city's priorities. Together, we identified opportunities to improve water and air quality, minimize flooding impacts, reduce the urban heat island effect, and lower energy consumption. Additional benefits include creating wildlife habitat, providing improved community aesthetics, reducing infrastructure costs, and increasing property values, demonstrating how nature-based solutions can support both environmental and social aspects.



CITY CONNECTIONS: PARKS & GREENWAYS

It is important to consider the surrounding context of multi-modal transit, and park and greenways to ensure that our design interventions fit seamlessly into downtown Raleigh. According to Raleigh's 2030 Comprehensive Plan, N West Street is part of a proposed primary north-south connection (shown in image 5.1). Our design aims not only to support pedestrian, bicycle, and vehicular movement but also to create a space where people want to linger and experience the area. Future Smoky Hollow Park will be located just northeast of the site. Our design considers the connection to Smoky Hollow park as well as future access to the Crabtree Creek Trail Greenway and the Rocky Branch Trail Greenway, allowing for a continuous network of parks and open spaces.

While pedestrian safety at crossings, such as Peace Street, as shown in Image 5.0 was not within the project's scope, it is essential to acknowledge these challenges. Peace Street is currently a busy roadway and safe connections will be critical for linking the site to Smoky Hollow Park and ensuring that residents and visitors can navigate the area safely and comfortably.

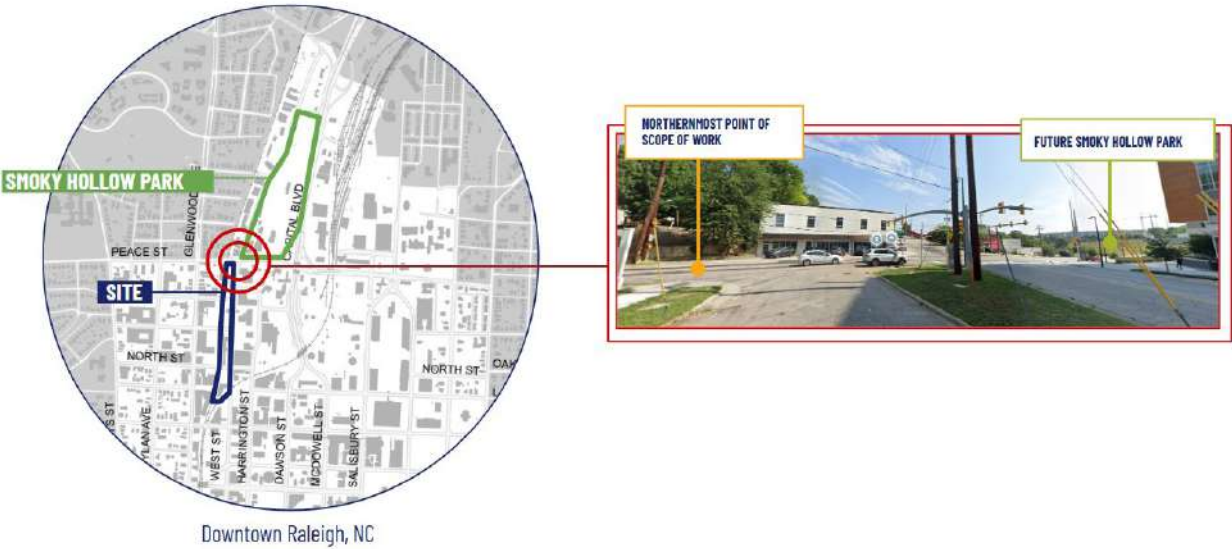


Image 5.0- This graphic shows the intersection of W Peace St and North West Street.

CITY CONNECTION MAP LEGEND

- EX. OPEN SPACE + PARKS
- EX. GREENWAYS
- EX. BICYCLE INFRASTRUCTURE
- FUTURE RALEIGH PARK (SMOKY HOLLOW)
- PROP. GREENWAY CONNECTIONS FROM RALEIGH 2030 COMPREHENSIVE PLAN

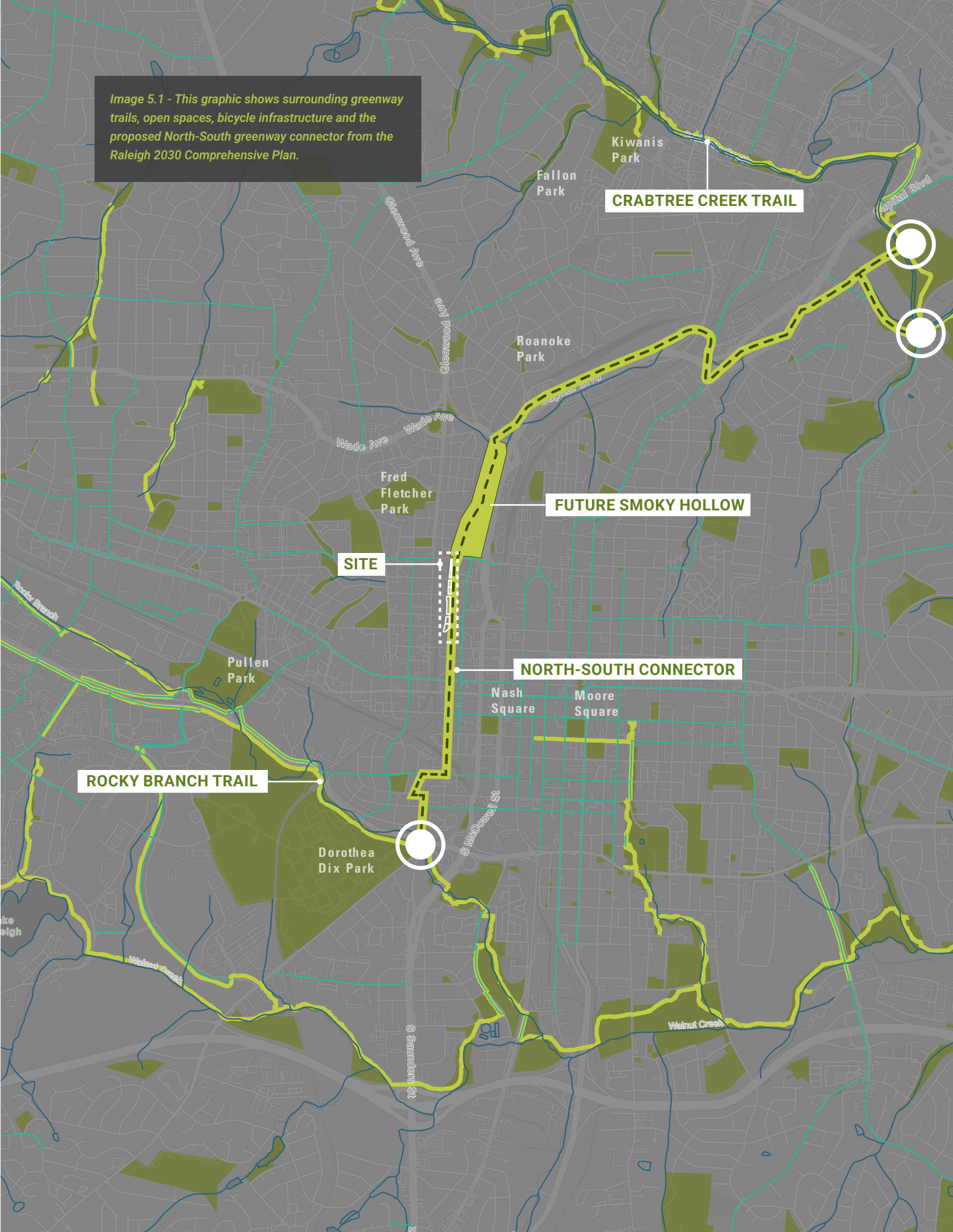


Image 5.1 - This graphic shows surrounding greenway trails, open spaces, bicycle infrastructure and the proposed North-South greenway connector from the Raleigh 2030 Comprehensive Plan.

MULTI MODAL TRANSIT AND EXISTING INFRASTRUCTURE

The site supports a mix of transportation modes, including pedestrians, bicycles, and buses. A northbound bicycle lane runs along the east side of N West Street and several GoRaleigh bus stops also serve the area. However, there are notable infrastructure gaps, including missing sidewalks on the west side of N West Street between W Johnson Street and Tucker Street. There is also no southbound bicycle lane along N West Street. This lack of infrastructure has contributed to pedestrian safety concerns, with two serious pedestrian crashes reported since 2022, as shown in Image 1.9 by the two orange-highlighted circles. The Strava heat map in Image 6.0 further indicates a high level of existing pedestrian and cyclist activity in the area, underscoring the need for design interventions that improve safety and not only accommodate current users but also future growth.

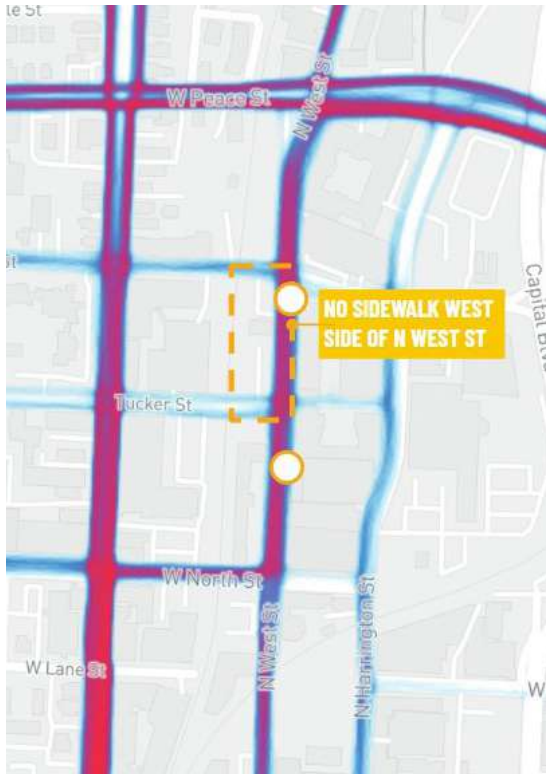


Image 6.0 - This Strava heat map and pedestrian crashes.



Image 6.1 - Image shows lack of pedestrian and bicycle infrastructure between W Johnson St and Tucker St on the west side of N West St.

Perception of Safety

Perception of safety was evaluated by analyzing crime statistics alongside a detailed lighting assessment.

CRIME DATA

To understand perceptions of safety, one year of crime data (2024–2025) was analyzed within a 500-foot radius of the site. There were 133 crimes against persons, primarily assaults; 233 crimes against property, mainly larceny and theft; and 735 crimes against society, with the top categories being weapons, drug violations, and misdemeanors (Image 7.0). The proximity to Glenwood South, Raleigh’s popular nightlife district, contributes to higher crime rates, emphasizing the importance of integrating safety-focused design strategies.

Lighting was also evaluated in relation to crime data. Two areas are poorly lit at night: a gravel parking lot between Peace Street and West Johnson Street, and an asphalt parking lot between West Johnson and Tucker Street. Building removal may reduce available light, while parking lot areas have minimal illumination. Observations show that intersections are well-lit, but additional lighting improvements are necessary to enhance the perception of safety.

CRIME DATA SUMMARY WITHIN 500 FT RADIUS OF SITE

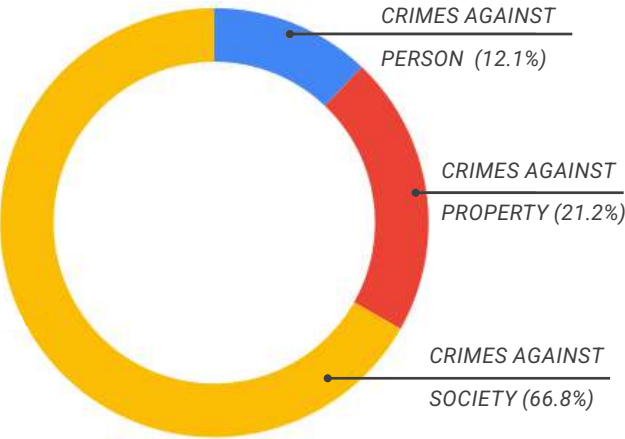


Image 7.0 - This image shows a summary of crime data.

Source: City of Raleigh Open Data Program

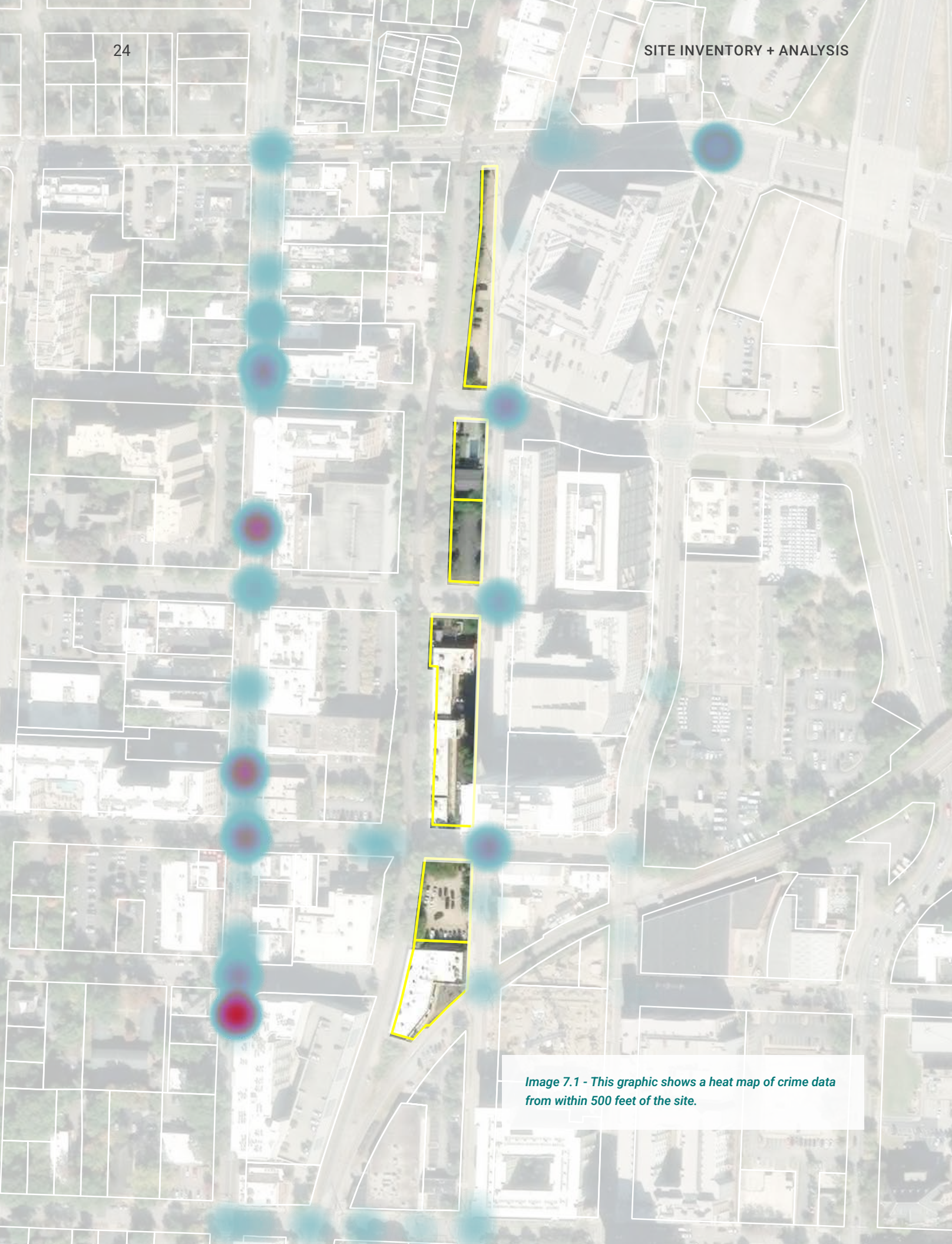
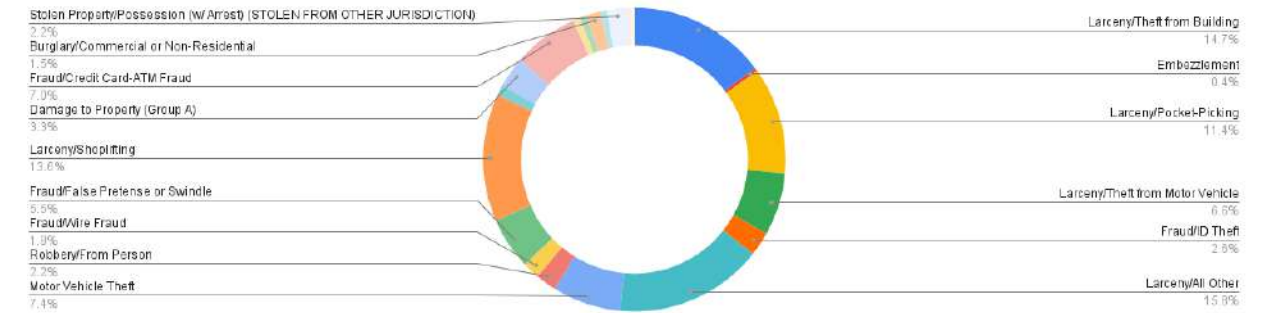


Image 7.1 - This graphic shows a heat map of crime data from within 500 feet of the site.

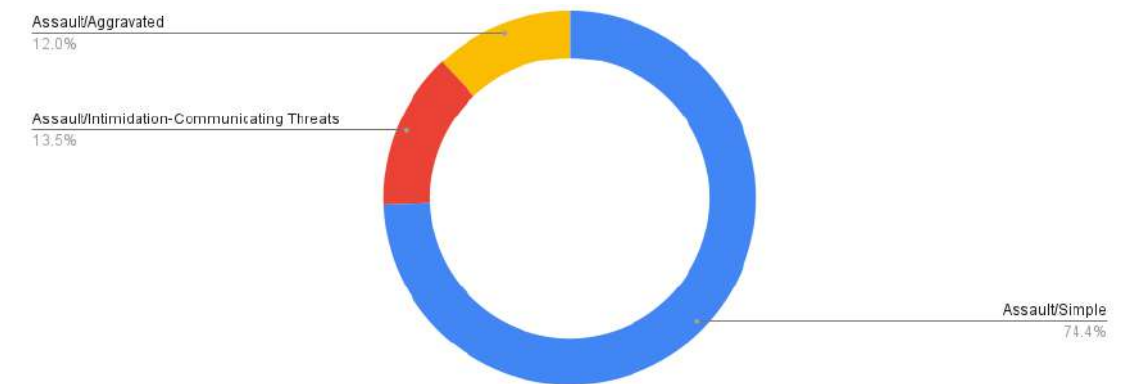
The following heat maps and pie charts provide a detailed breakdown of each crime category: crimes against persons, crimes against society, and crimes against property.

CRIMES AGAINST PROPERTY WITHIN 500FT BUFFER OF SITE



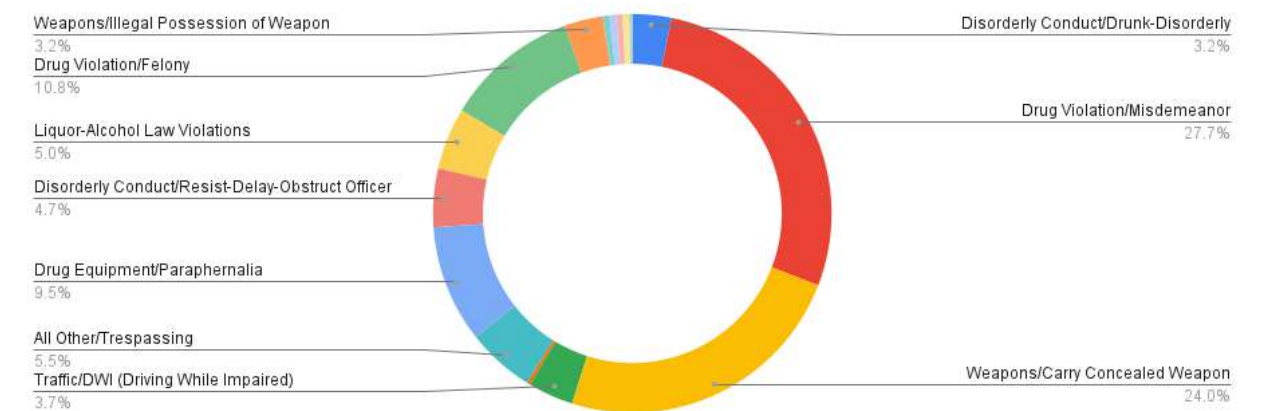
Between 2024 and 2025, there were 233 reported incidents of 'Crimes Against Property' within 500 feet of the site.

CRIMES AGAINST PERSON WITHIN 500FT BUFFER OF SITE



Between 2024 and 2025, there were 133 reported incidents of 'Crimes Against Person' within 500 feet of the site.

CRIMES AGAINST SOCIETY WITHIN 500FT BUFFER OF SITE



Between 2024 and 2025, there were 735 reported incidents of 'Crimes Against Society' within 500 feet of the site.

Source: City of Raleigh Open Data Program

LIGHTING

Lighting was also evaluated in relation to crime data. Two areas are poorly lit at night: a gravel parking lot between Peace Street and West Johnson Street, and an asphalt parking lot between West Johnson Street and Tucker Street. Much of the existing lighting on the site comes from adjacent buildings. With the construction of the viaduct and railroad, these buildings will be removed, eliminating these light sources. This reaffirms the importance of considering lighting strategies in the site to enhance both the actual safety and the perception of safety throughout the site.



The image highlights areas with minimal lighting between West Peace Street and West Johnson Street.



The image highlights minimal lighting at the paved parking area between West Johnson Street and Tucker Street.



The image shows lighting coming off the Whiskey Rose building along North West Street.



Crime Prevention through Environmental Design (CPTED)

CPTED is a multidisciplinary approach that uses urban and architectural design to manage built and natural environments. These strategies aim to reduce victimization, deter criminal activity, and foster a sense of community among residents and visitors by encouraging territorial control, reducing opportunities for crime, and minimizing fear.

CPTED STRATEGIES

1. Natural Surveillance

Design spaces to maximize visibility. Ensuring people can see and be seen discourages criminal behavior and increases the sense of safety. Examples include open sight lines, lighting, seating placement, and strategic building or landscape design.

2. Social Management

Promote uses of space that bring people together. Increased community presence reduces opportunities for crime. Examples include programming frequent activities, encouraging natural surveillance with “eyes on the street,” and designing spaces so people can see and be seen. Additional strategies include lighting walkways, clear wayfinding, and signage to support visibility.

3. Maintenance

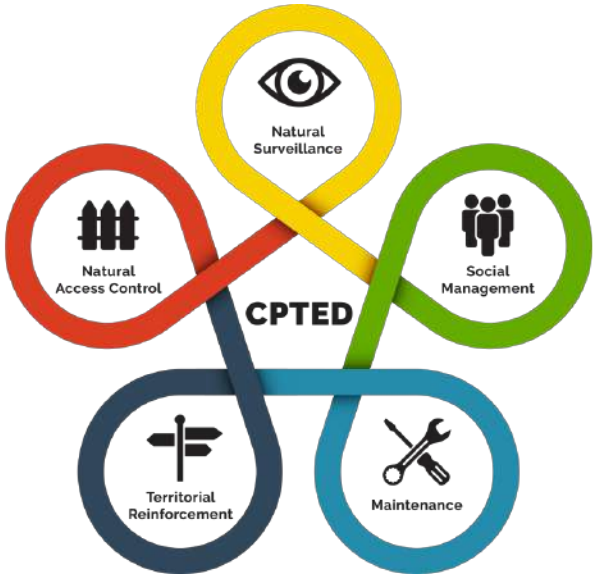
Well-maintained spaces signal care and active presence, which can deter crime and reinforce community stewardship, aligning with the Broken Windows Theory. Examples include regular upkeep and opportunities for community involvement, such as volunteer trash pickup or programming.

4. Territorial Reinforcement

Encourage a sense of ownership over a space. When people feel a space is “theirs,” they are more likely to monitor and protect it. Examples include signage, community murals, local art, and consistent maintenance.

5. Natural Access Control

Use design to clearly define entrances, exits, and circulation flow. Pathways, landscaping, and other elements guide movement and reduce opportunities for unauthorized access. Examples include directional pathways, fences, or landscape features that subtly steer behavior.



Precedent Studies

Fly Over the Flyover
HONG KONG, CENTRAL BUSINESS DISTRICT
(CBD)

DAY ACTIVATION

Story telling and urban activation through art, murals, and up-cycled materials.

RELEVANT FEATURES

Located in Hong Kong’s core business district, the project activates an underused space with colorful murals, freight containers for economic activation and work stations.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

Art and storytelling celebrate local culture, while flexible infrastructure and recycled materials support sustainability and economic activity. The mix of visual art, play, and commerce creates a lively, inclusive public space.

LESSONS LEARNED

Combining culture, art, and adaptable programming strengthens community, encourages engagement, and turns underutilized areas into valued public space.



Viaduct Des Arts

PARIS, FRANCE

DAY + NIGHT ACTIVATION

Activating underutilized space beneath a historic rail corridor through shops, workshops, and galleries to support economic and community life.

RELEVANT FEATURES

Located beneath a historic elevated railway, this project transforms inactive rail space into a vibrant corridor that supports the areas culture with workshops, galleries, boutique shops, and other flexible uses.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

In contrast to the ‘Viaduct des Artes’, where buildings are attached to the inactive railway, structures in Raleigh would need to be freestanding, with space for maintenance and access.

LESSONS LEARNED

Adaptive reuse of historic infrastructure can generate economic opportunity, activate public space, and make the most of underused areas, but context-specific constraints, such as freestanding buildings for safety and access, must be addressed.



The Underline

MIAMI, FLORIDA

DAY ACTIVATION

Transforming underutilized urban space into flexible plazas and activity zones with pet-friendly amenities and clear wayfinding.

RELEVANT FEATURES

The Miami Underline transforms an underutilized corridor into a series of flexible spaces and plazas. It accommodates group fitness classes, performance areas, and farmer’s markets, ensuring the space can host a wide variety of activities for different users.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

The project integrates wayfinding and signage in multiple forms, making the space navigable and welcoming. Pet-friendly features, including dog parks and water stations, expand usability and inclusivity, encouraging community engagement.

LESSONS LEARNED

Designing flexible, adaptable spaces allows for diverse programming and maximizes the use of underutilized areas. Incorporating amenities for pets and clear navigation enhances accessibility, user experience, and long-term activation of urban corridors.



The Bentway

TORONTO, CANADA

DAY ACTIVATION

Creating urban rooms with year-round, flexible programming beneath an elevated highway.

RELEVANT FEATURES

The Bentway transforms space beneath Toronto’s elevated highway into a connected public corridor that remains active in every season. Programming ranges from performances and markets to ice skating in the winter.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

Columns are used to create a series of “urban rooms,” organizing the space into distinct zones while keeping it open and adaptable. Flexible infrastructure supports rotating uses that can shift with seasons and community needs.

LESSONS LEARNED

Using existing structural elements to define space creates a strong sense of place. Pairing this with a year-round activation strategy ensures consistent engagement and maximizes the value of underused infrastructure.



Underpass Park
TORONTO, CANADA

DAY ACTIVATION

Defining space and encouraging expression through playful forms and community art.

RELEVANT FEATURES

Underpass Park uses ribbon-like wall structures to not only create sculpture seating, but also to define activity zones and guide movement through the space. These forms bring a playful, “wild” element to the urban setting.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

The design encourages community expression by welcoming graffiti and street art. This approach gives local residents a sense of ownership and keeps the space dynamic and evolving.

LESSONS LEARNED

Seating walls can serve a dual purpose by providing places to sit while also helping to define and organize space. Additionally, creative community expression can help transform underutilized infrastructure into a place that feels inclusive, active, and authentically tied to its community.

NIGHT ACTIVATION

Brightening underpasses with art and light to create safe, active, and engaging public spaces.

RELEVANT FEATURES

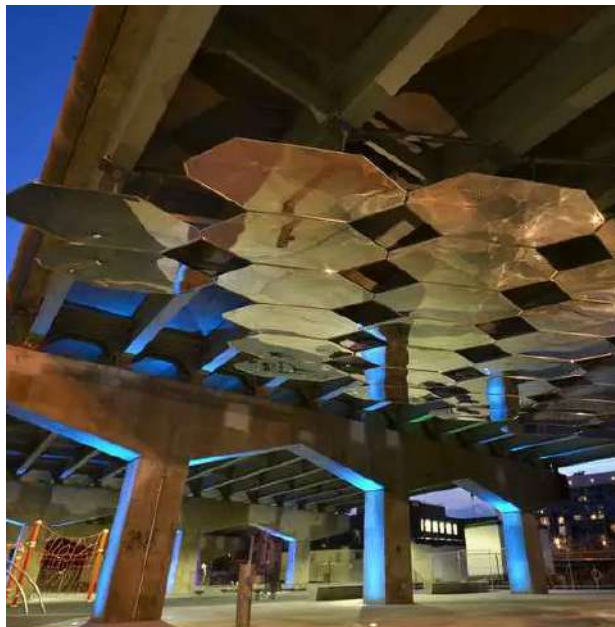
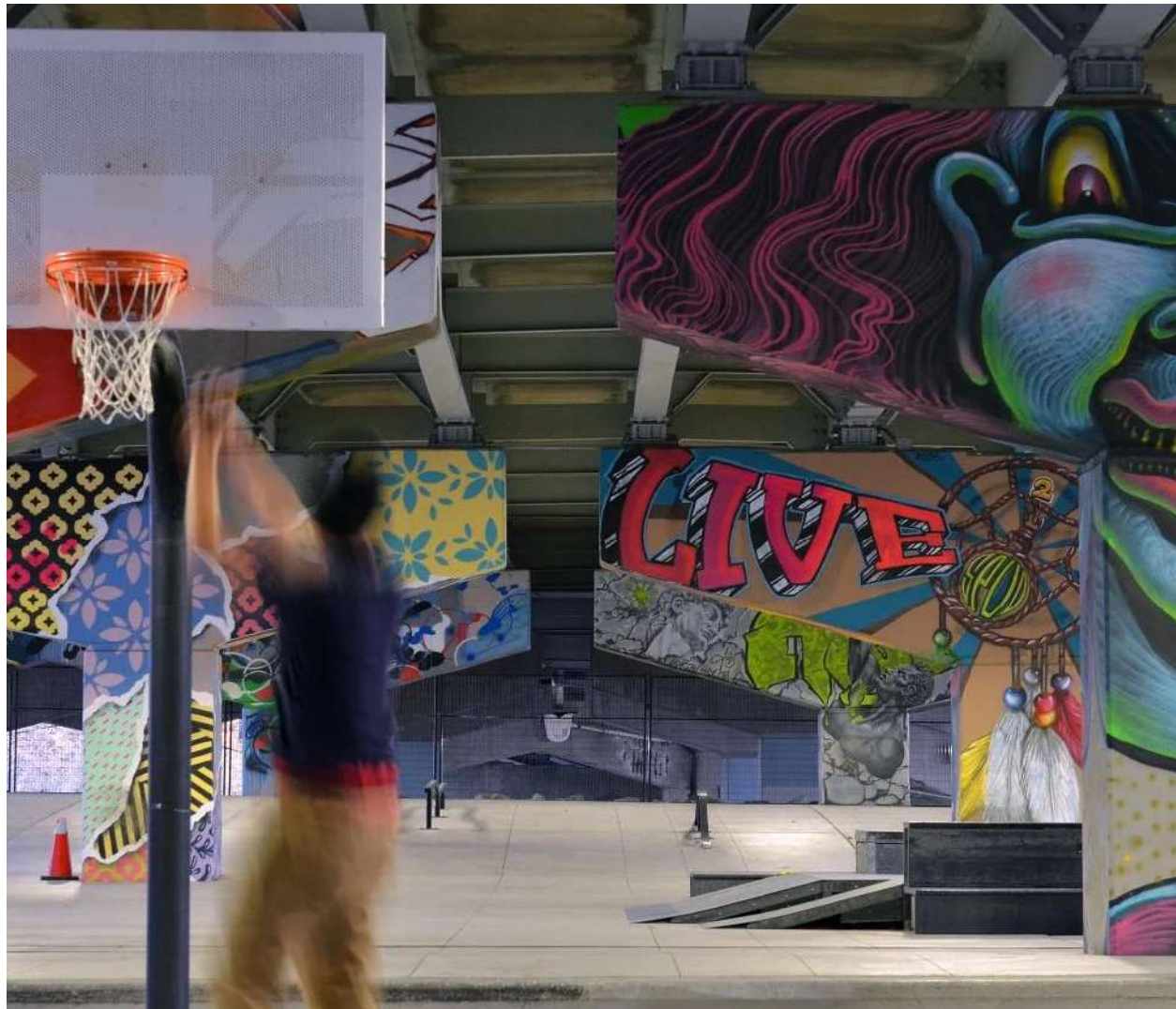
Underpass Park uses art and lighting to transform a formerly dark space into a welcoming public area. Uplighting, LED installations, and the artwork bring color and energy to the site.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

Lighting serves both artistic and functional purposes by animating the space at night and improving safety and wayfinding. The design encourages people to continue to use the area after dark, turning it into a lively gathering spot.

LESSONS LEARNED

Thoughtful use of art and light can change public perception, improve safety, and extend the usability of urban spaces into the evening hours.



Aspire Sydney
SYDNEY, AUSTRALIA

NIGHT ACTIVATION

Using art and light to transform dark, unsafe spaces into vibrant public experiences.

RELEVANT FEATURES

Aspire Sydney turns a previously dark, unwelcoming underpass into an engaging public space. Large-scale art installations make the area more inviting, increase amount of lighting and improve the perception of safety.

SUCCESSFUL DESIGN STRATEGIES AND ELEMENTS

Art and lighting create an immersive, ethereal experience for pedestrians while also remaining highly visible to fast-moving cars.

LESSONS LEARNED

Strategic use of art and light can deter crime, slow down traffic, and improve general safety.



Stakeholder Engagement

Target Audiences and Stakeholders

Throughout the duration of the project, a range of stakeholders were engaged to inform the project’s vision and values as well as to provide feedback during stages of the design process. Involving these stakeholders was essential not only to ensure that the design reflects community needs and priorities but also to support their capacity to carry the project forward once the NC State team is no longer directly involved. The diagram below identifies the stakeholders engaged in this process.



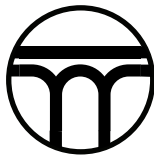


Stakeholder Engagement Event

On May 20th, a stakeholder engagement event was held to gather feedback on the inventory and analysis as well as the precedent study phase. The purpose of this event was to refine our research and ensure the strongest possible foundation for the project’s next stages.

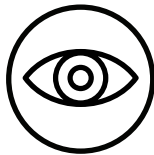
During the session, we presented the findings from our inventory and analysis and shared relevant precedent studies. Stakeholders then participated in an interactive workshop designed to capture diverse perspectives. Attendees were divided into four groups of approximately five participants each and engaged in guided discussions using a series of question prompts.

QUESTION PROMPTS



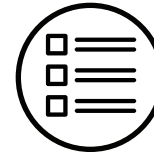
Knowing the Space

Goal: Understand how people relate to the space and what’s working, or not.
Prompt: How do you relate to/identify with this space and the surrounding area, including Smoky Hollow and Glenwood South? What feels meaningful, important, or challenging about this place to you?”



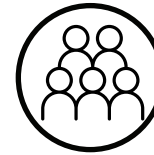
Values and Vision

Goal: Identify overarching priorities, values, or themes that should shape the design.
Prompt: Imagine this space 10 years from now, with a viaduct in place. What are a few words or a short phrase that describe what this space should represent or support? Why do those values matter in this context?



Programming “Grocery List”

Goal: Gather insight of functional uses and desired activities.
Prompt: What are the types of programming that would drive the physical manifestation of your group’s values and vision? Select 4-5 programming elements from the ‘grocery list’ or invent your own.



Project Leadership

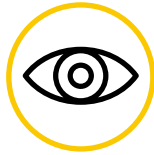
Goal: Brainstorm a task force.
Prompt: If you were going to make a task force of people, and the groups they represent to champion this project, who would that be? This team would help move the project forward by supporting efforts like securing funding, refining the concept, and guiding implementation.

Outcomes Of Stakeholder Engagement

Challenges and opportunities, guiding principles, and desired programming were identified through group discussions and collaborative activities. These outcomes helped to inform future design ideations.



- Lack of green and public space; mobility barriers
- Need for activation, connectivity, and stormwater solutions
- Opportunity to create an urban trail and link to Smoky Hollow Park



- Prioritize safety, nature, connectivity, and sense of place
- Blend city-wide impact with a local identity
- Make this a top Raleigh destination



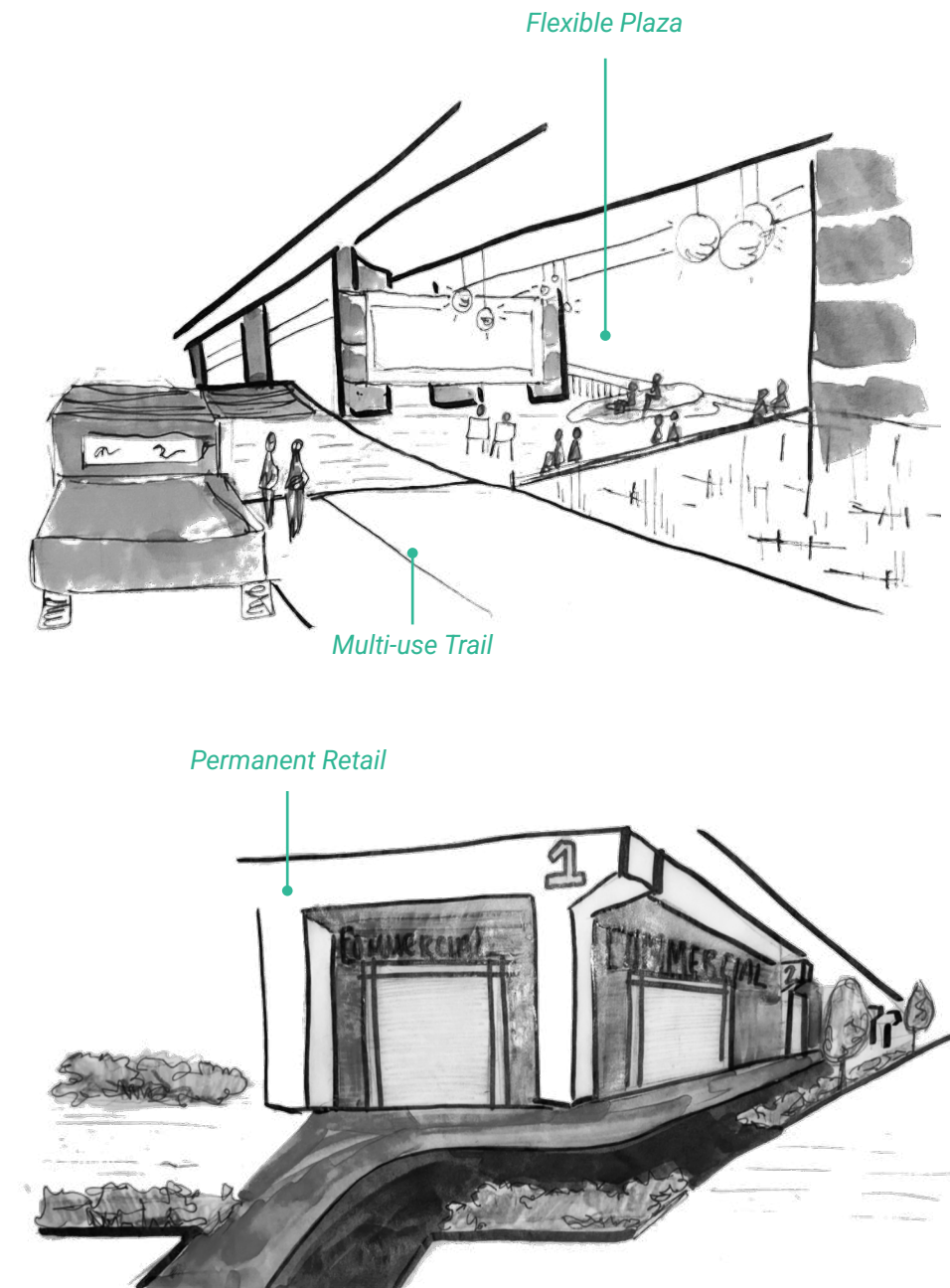
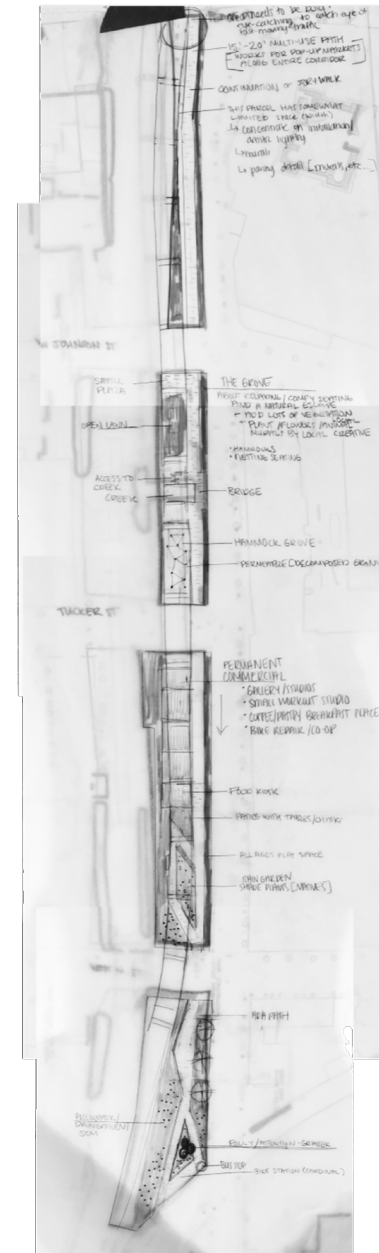
- Multi-use paths, green infrastructure, dog and children play areas
- Pop-ups, performance spaces, food trucks, micro-retail
- Wayfinding and lighting as defining features



- Several stakeholders who attended the engagement event expressed interest in helping to champion the S-Line project after the NC State team completes its role in the project.



Design Concept Ideation

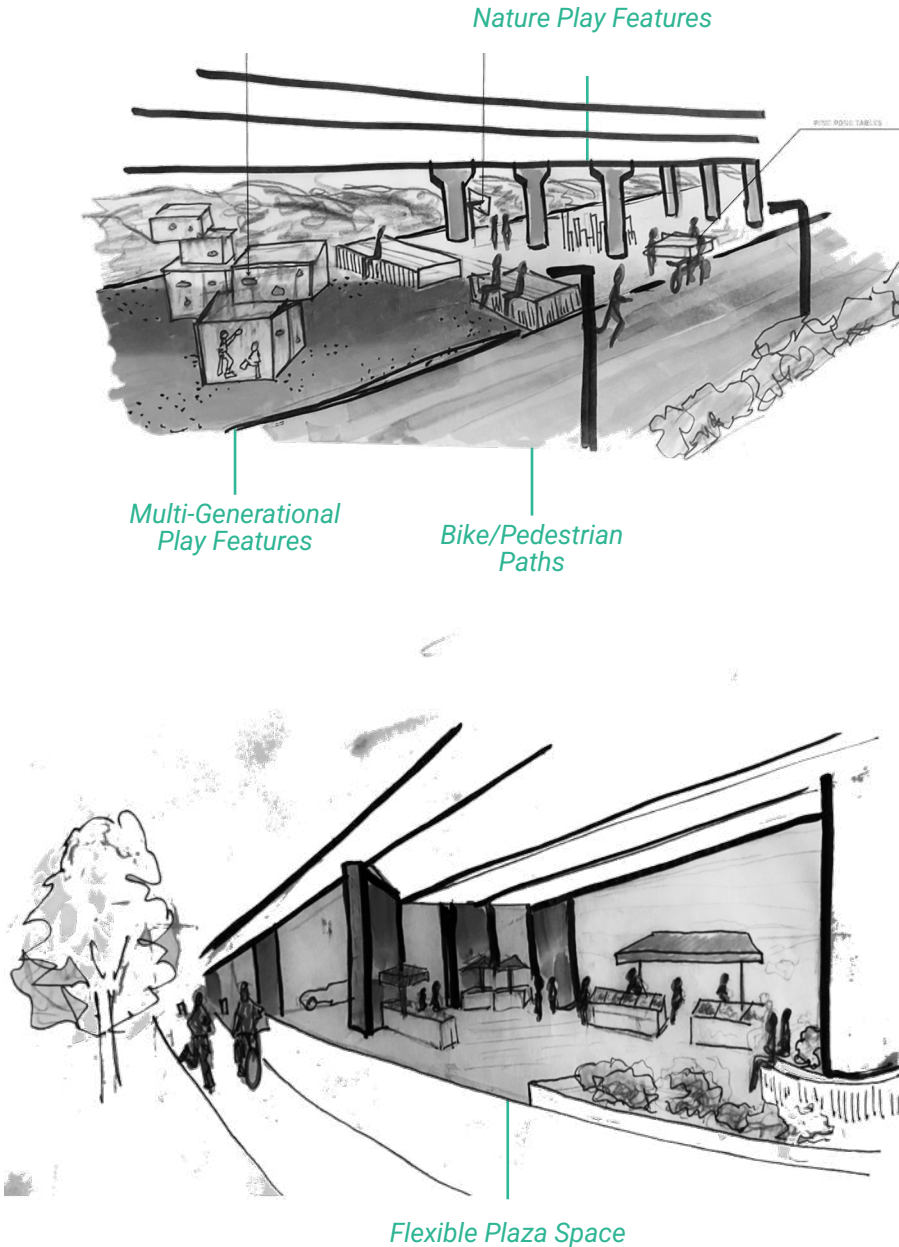
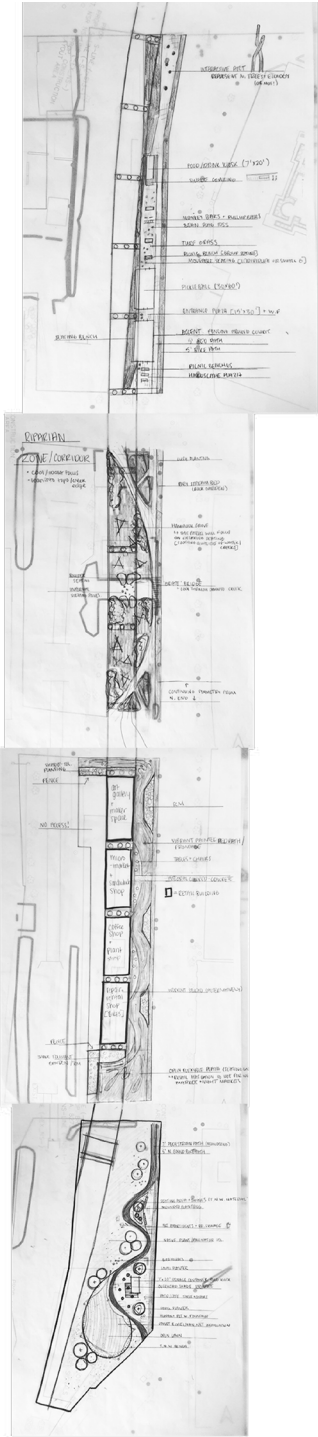
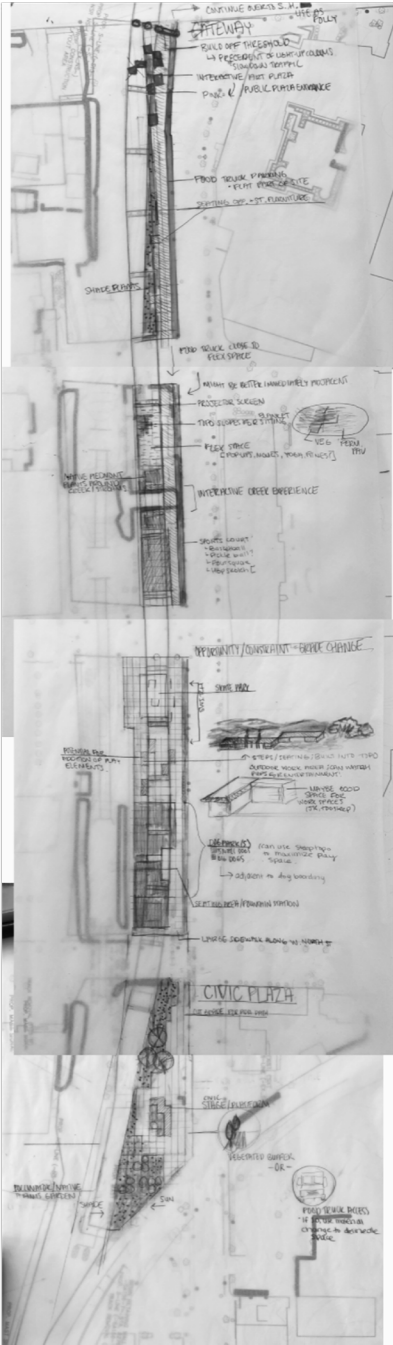
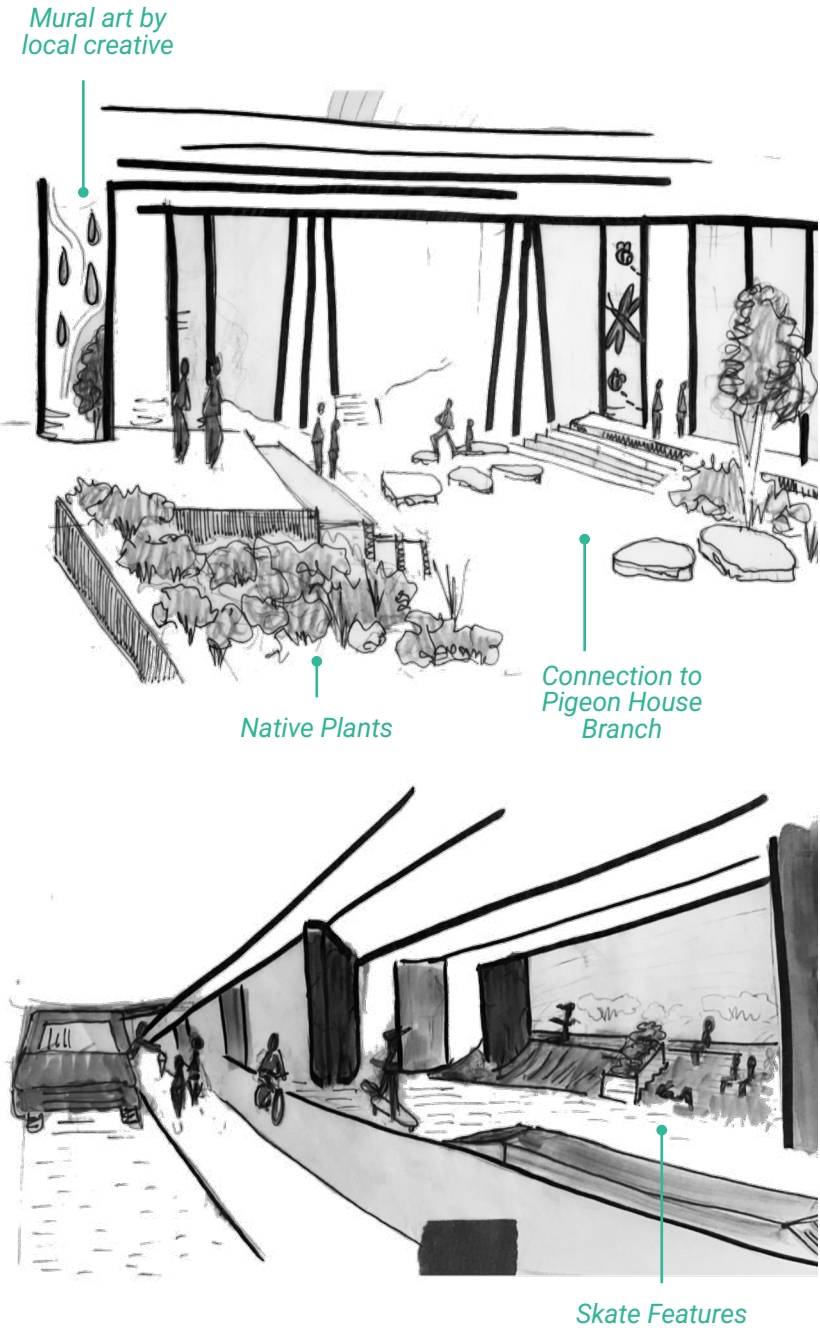


Design Ideation

The design concept ideation process was guided by the feedback collected during the stakeholder engagement event. This feedback then played a critical role in guiding the design concepts.

One of the key takeaways from the event was

the need for more public green space that is accessible to all users, including pedestrians and cyclists. Participants emphasized the importance of connectivity and activation within the site, which inspired the integration of an urban trail across most of the design concepts. This decision also

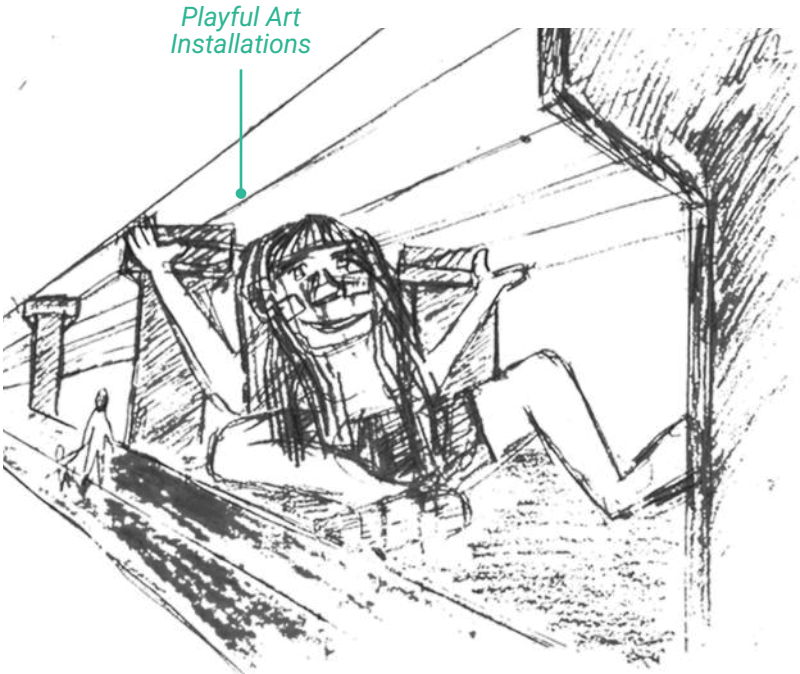
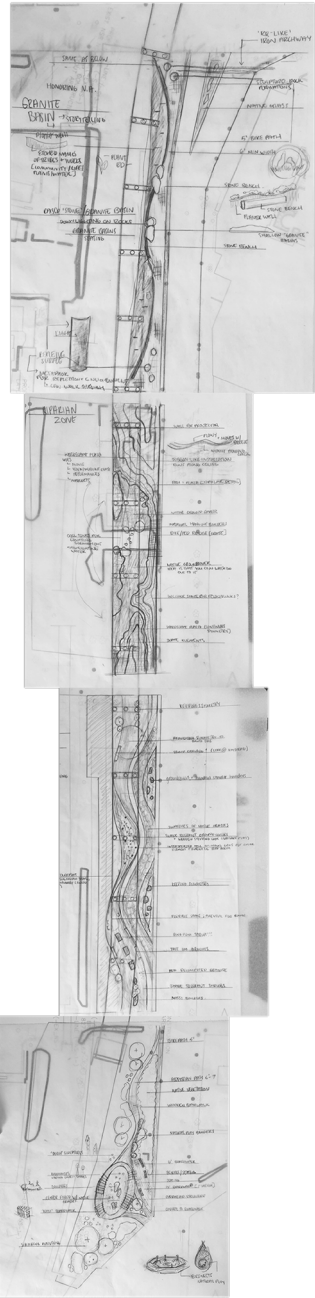


aligns with findings from the inventory and analysis phase, which identified North West Street as a primary north-south connector within the City of Raleigh, making it an ideal location for enhanced mobility infrastructure.

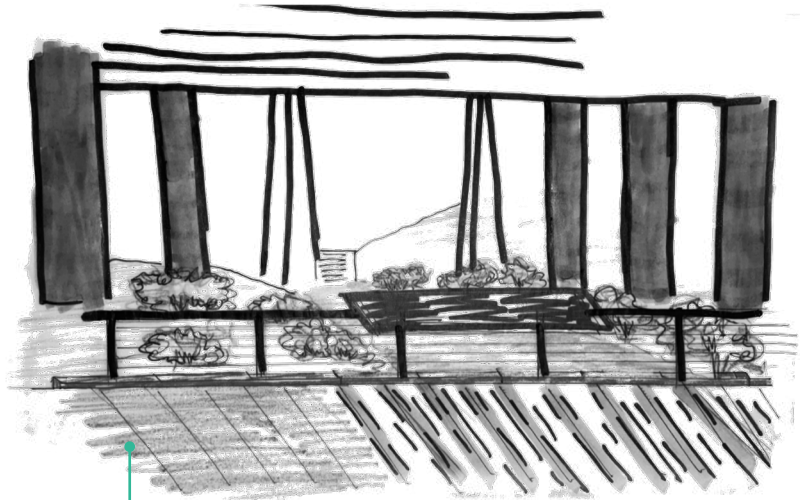
Additionally, the “grocery list” of desired amenities developed during the stakeholder event highlighted a strong preference for multi-use paths, green infrastructure, and play areas for both children and dogs. These desires were translated into

design concepts through the inclusion of multi-generational play areas and strategically located green spaces. Stakeholders also expressed a need for flexible, multipurpose spaces to accommodate activities such as performances, workout classes,

food trucks, and micro-retail. This feedback informed the inclusion of flexible, open spaces throughout the concepts, allowing the site to support a variety of uses over time.



Playful Art Installations



Bike/Ped Bridge over Pigeon House Branch

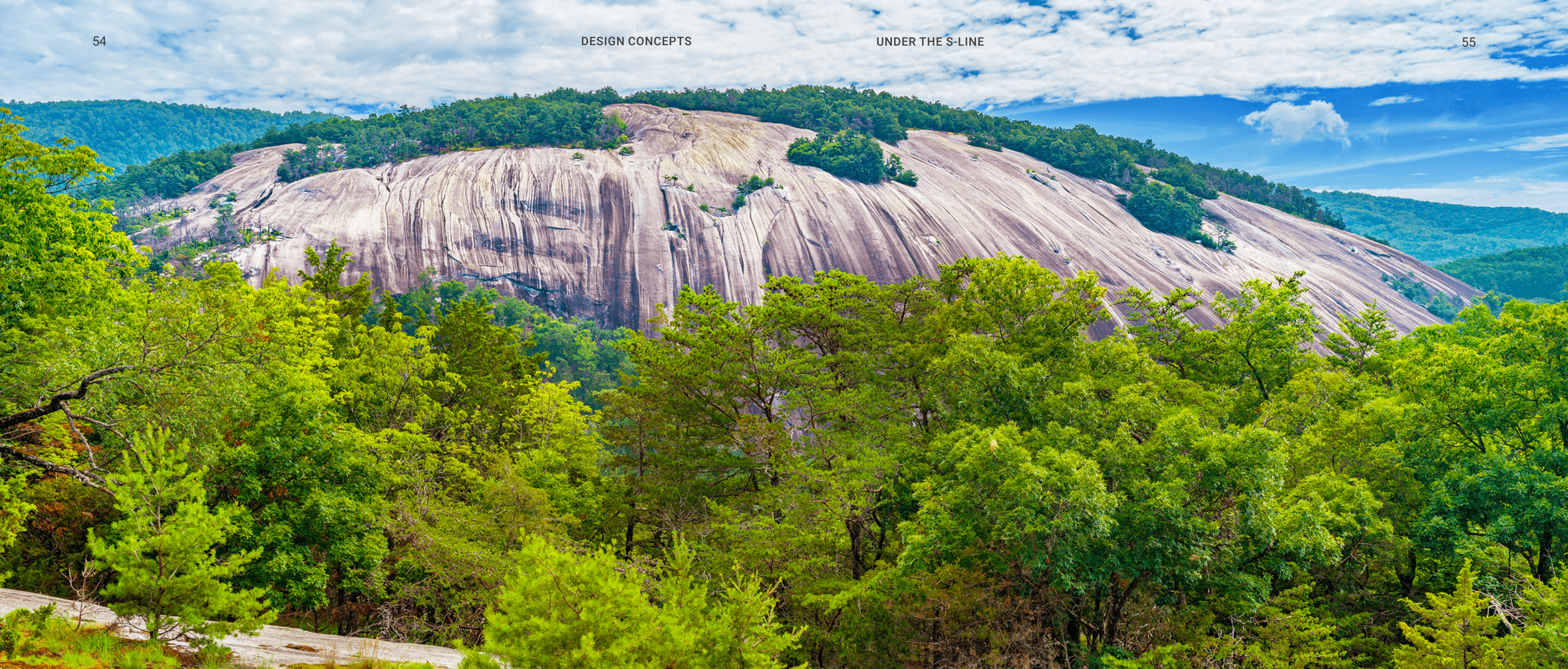
Design Concepts



The Living Line

The Living Line concept transforms the space beneath the S-Line viaduct into a journey through four of North Carolina's distinct ecological zones: Granite Domes, Riparian Corridor, Urban Woodland, and Piedmont Prairie. Each city block is designed to mimic our native landscapes, creating an

immersive experience that highlights local ecology and identity. This unique urban trail combines both active and passive recreation, offering a shaded path for downtown residents to stroll to Smokey Hollow Park, as well as fun play features for children and pets.

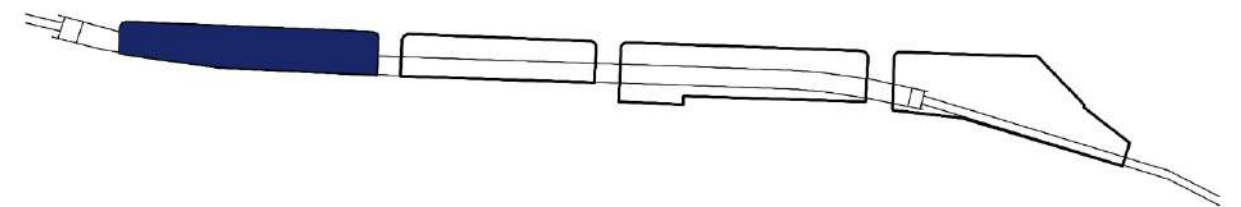


Granite Domes

Rocky outcrops with hardy plants and textured stone.

Inspired by North Carolina's granite domes, which are rocky outcrops found in upland and mountainous regions, this first zone highlights the state's geologic character. These natural formations feature thin soils, mosses, and hardy plant communities that thrive in challenging conditions.

In the design, this translates into a variety of hardscape treatments and stone textures, with stepping elements and play features that invite visitors to experience the geology up close through touch and movement.



Troll Haven

Serving as the northern gateway into downtown, Troll Haven is inspired by Thomas Dambo’s large-scale troll installations. This sculptural landmark functions as a folly, a playful point of orientation, and an artistic entry feature. Additional wayfinding is incorporated on the viaduct, marking the nearest intersection.

From Troll Haven, a sequence of natural play elements such as boulders and stepping stones encourage playful movement and exploration deeper into the site.



THE LIVING LINE



Big Screen Plaza

Approaching West Johnson Street, visitors encounter the Big Screen Plaza, a flexible public space that accommodates movie nights, pop-up markets, and artist showcases. Meandering pathways encourage wandering and lingering, while a direct pedestrian route allows efficient passage.

A six-foot-wide bike path runs the full length of the corridor, providing safe, continuous movement and reducing potential conflicts between cyclists, scooters, and pedestrians.

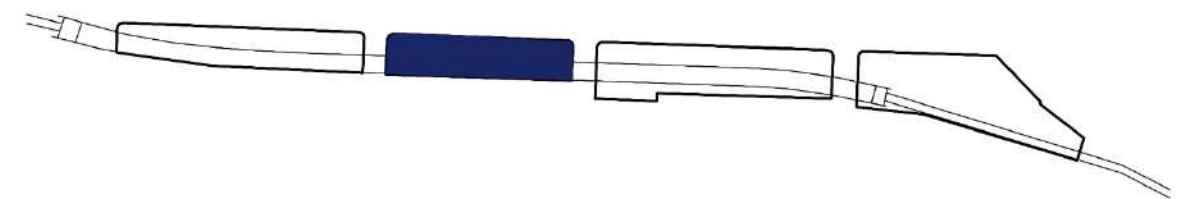




Riparian Corridor

Streamside habitat that cools, filters, and restores.

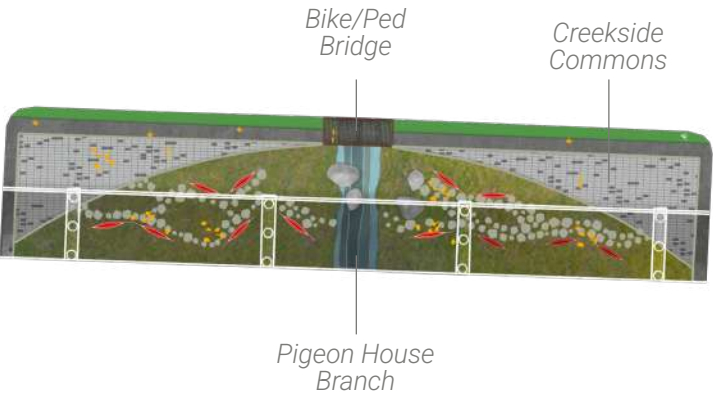
The second zone highlights Pigeon House Branch, the only visible creek in downtown Raleigh, and is inspired by riparian ecosystems that filter stormwater, support wildlife, and provide cooler microclimates.



Creekside Commons

Seating areas are nestled within native grasses and plantings, allowing visitors to feel immersed in a creekside environment while enhancing stormwater filtration. Introducing significant pervious surface in this predominantly hardscaped area improves the health of the watershed. Hammock paths, stepping stones, and shaded resting areas create a comfortable retreat on hot summer days.

A flexible pop-up market plaza and food kiosks bring energy and activity to the space, creating a balance between restoration and gathering. Pedestrian and bike paths continue through this zone, ensuring seamless connectivity.



THE LIVING LINE

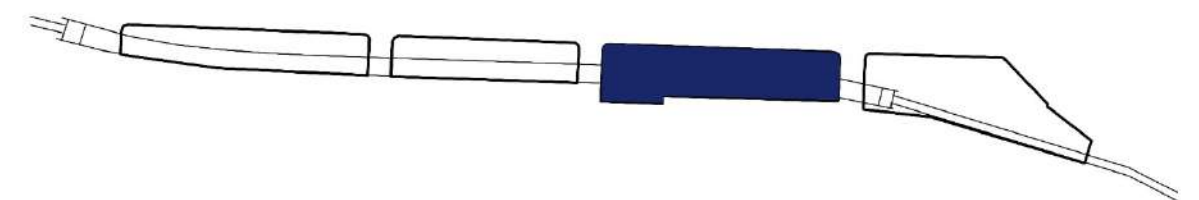




Urban Woodland

Layered canopy, shrubs, and ground cover for refuge.

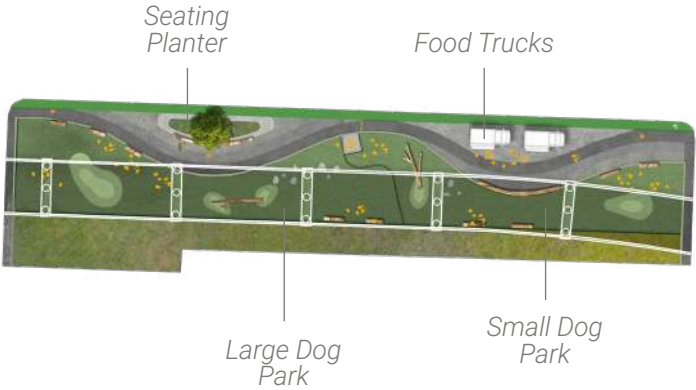
The third zone takes inspiration from urban woodlands, which are defined by layered vegetation including canopy trees, understory shrubs, and groundcover. These habitats support birds and pollinators, enhance air quality, and provide year-round visual interest.



Dog Park

Curvilinear paths, layered planting beds, and textured ground cover create a woodland-inspired character. This block focuses on community-centered recreation, with separate play areas for large and small dogs and ample seating for owners to gather and socialize. Food trucks, shaded seating, and flexible gathering spaces add vibrancy, transforming the site into a lively social hub.

The repeating vertical rhythm of the viaduct columns creates a canopy-like framework, echoing the experience of walking among tree trunks. Beneath this structure, undulating paths, open dog play areas, and lush planting create a layered experience that merges infrastructure with nature.

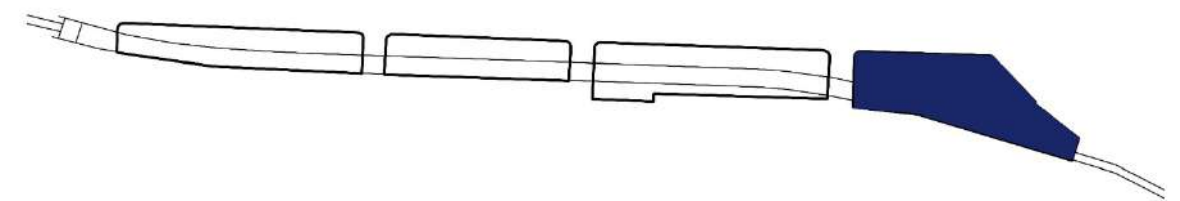




Piedmont Prairie

Native grasses and wildflowers supporting pollinators.

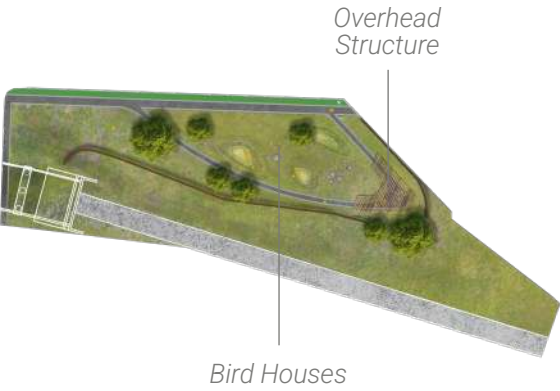
The final zone celebrates the Piedmont prairie, which once stretched across North Carolina and is now rare. These prairies are ecologically valuable, supporting grasses, wildflowers, and pollinators while adding seasonal color and resilience.

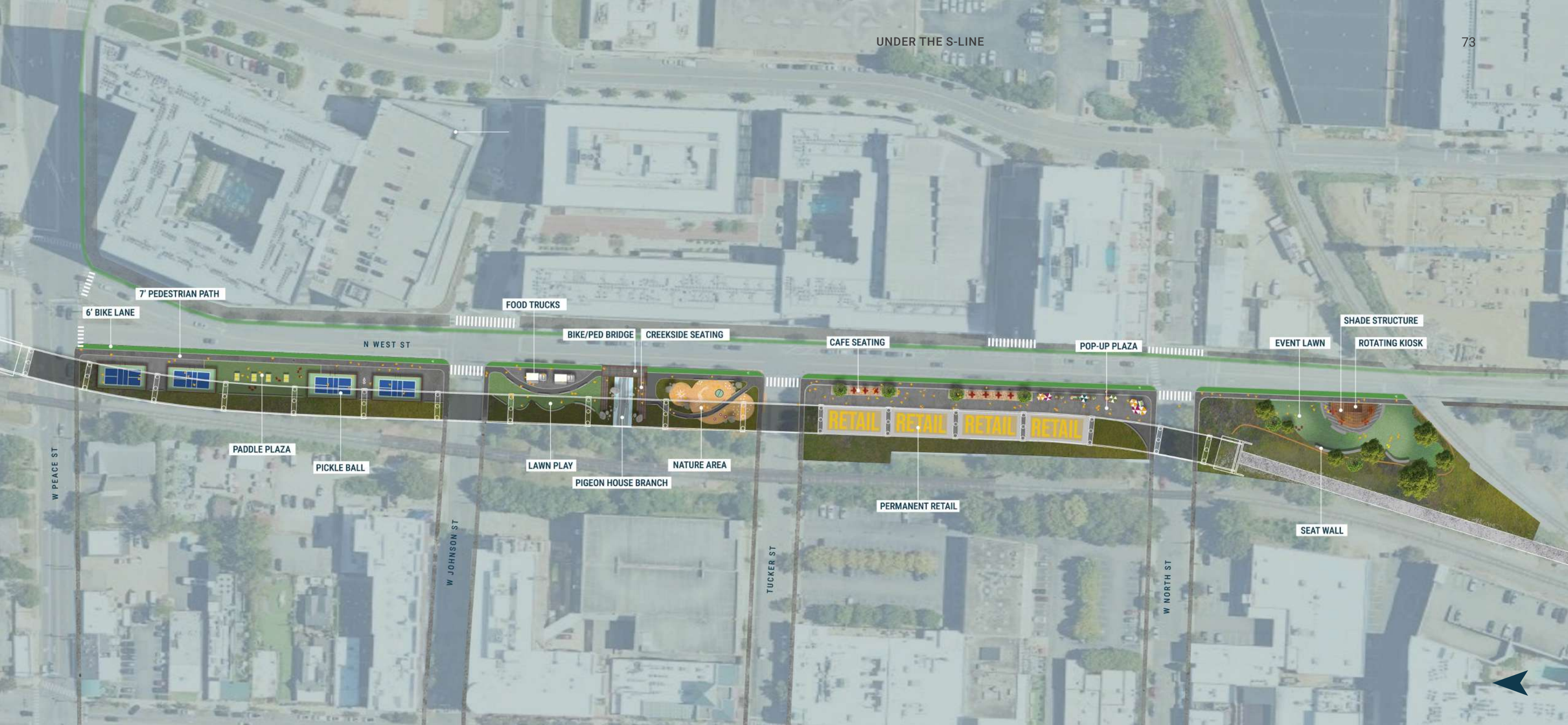


Prairie Lawn

This block takes advantage of its nearly full sun exposure, creating a meadow-like environment with native grasses and wildflowers. Winding paths allow visitors to immerse themselves in the landscape, while artistic birdhouses add habitat and visual interest. Shaded seating areas provide comfort within this open, sunny environment.

This design builds on existing community interest in the site’s ecology, strengthening habitat for native species and encouraging ongoing engagement with urban biodiversity.





The Raleigh Spine

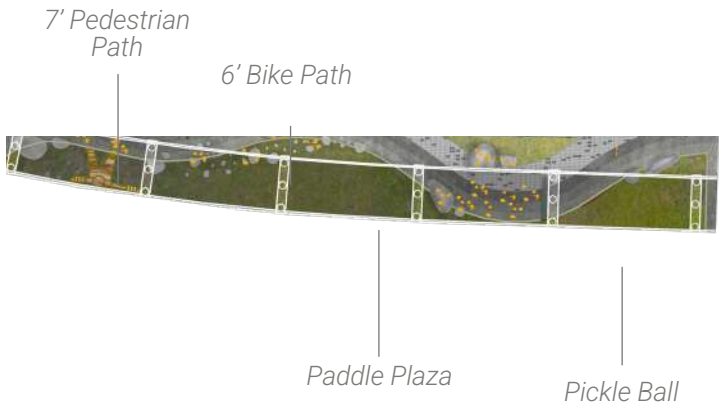
The Raleigh Spine transforms the space under the S-Line viaduct into a lively corridor designed to welcome all. This urban spine combines play, shopping, and areas for shady relaxation. You can stay active on multi-use paths, at the paddle courts, or in more passive play areas. For those who

want to shop or grab a bite, the corridor includes permanent shops, a food kiosk, and rotating food trucks. When you need a break, you can find a moment of calm in the flexible lawn and plaza spaces, surrounded by layers of natural green infrastructure.

Paddle Plaza

At the northernmost parcel, four 30 by 60 foot pickle-ball courts and a recreation turf create an immediate sense of activity and welcome. With over 3,500 residents living nearby, this space provides an inclusive recreational anchor for the growing neighborhood. A “paddle plaza” adjacent to the courts features turf games such as ping-pong and ga-ga ball, along with relaxed seating for spectators.

A continuous 7-foot pedestrian path and 6-foot bike lane traverse the site, providing efficient and safe movement, while offering opportunities to pause, linger, and watch the activity.



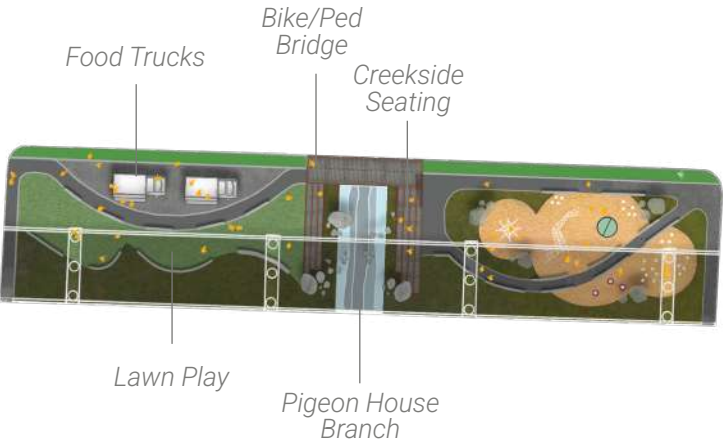
THE RALEIGH SPINE



Lawn Play

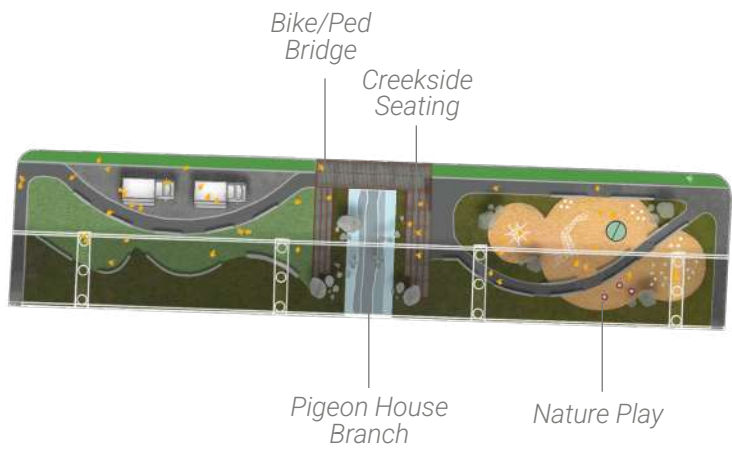
Moving south, the design opens into a flexible play lawn adjacent to food truck parking. This space accommodates active recreation, gatherings, and casual dining, supported by rotating food trucks that bring local entrepreneurship into the corridor.

Nearby, the only visible creek in downtown Raleigh is celebrated with built-in stone seating, providing a restorative place to relax and enjoy cooler temperatures during the summer.



Nature Play Area

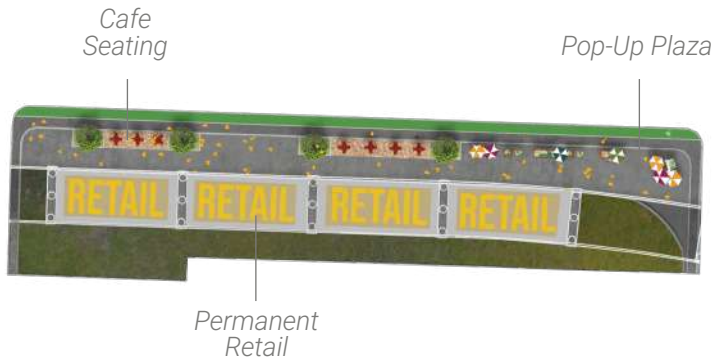
Just south of the creek, a natural play area features climbing structures, stepping logs, and casual seating. This space uses natural materials to create a playful, tactile experience for children while offering a comfortable place for parents to gather and supervise.



Permanent Retail

The next parcel focuses on economic activation and nighttime vibrancy. Permanent retail spaces such as cafés, maker studios, or galleries bring consistent activity and encourage small business growth. String lights and outdoor seating create a welcoming atmosphere after dark.

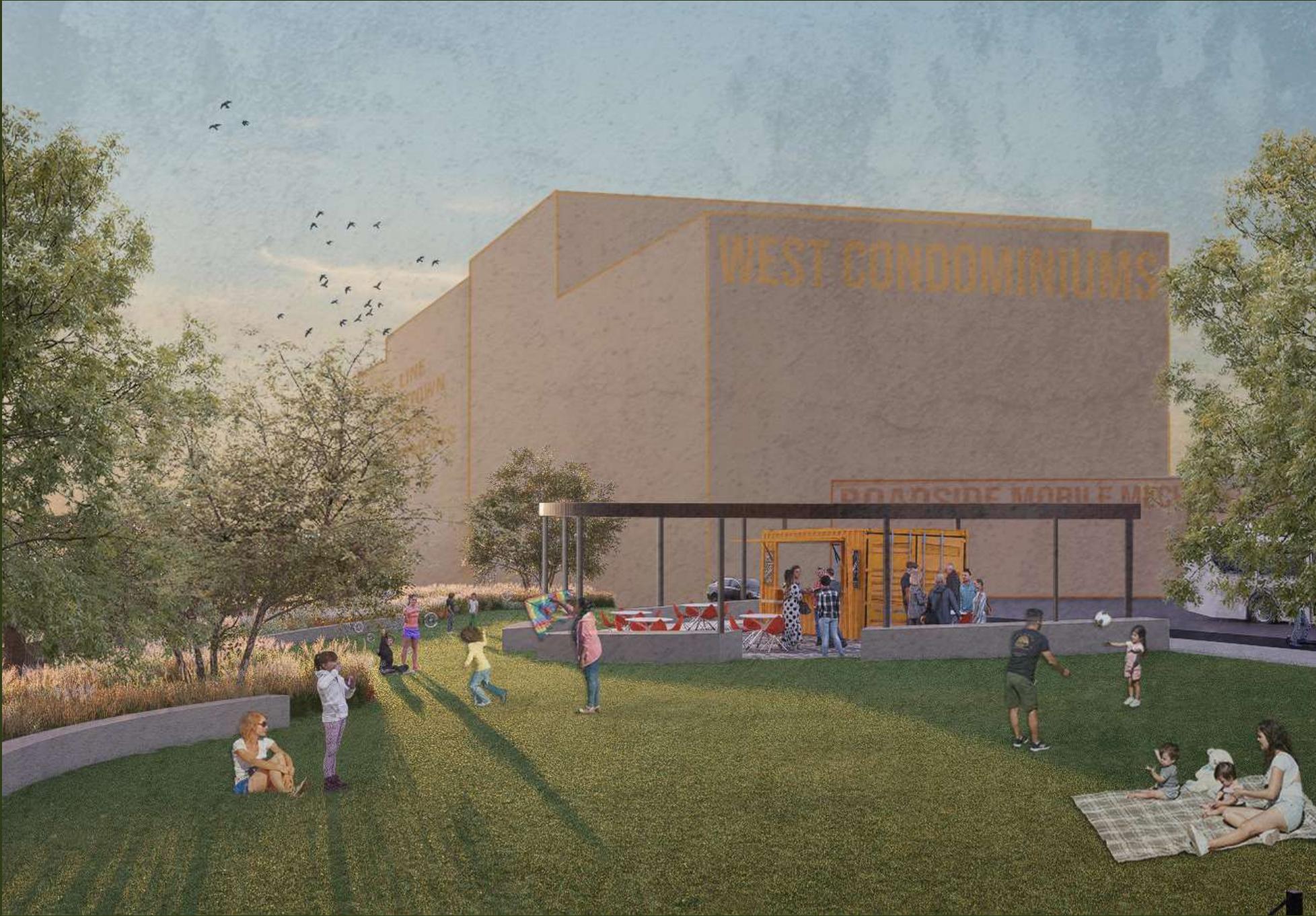
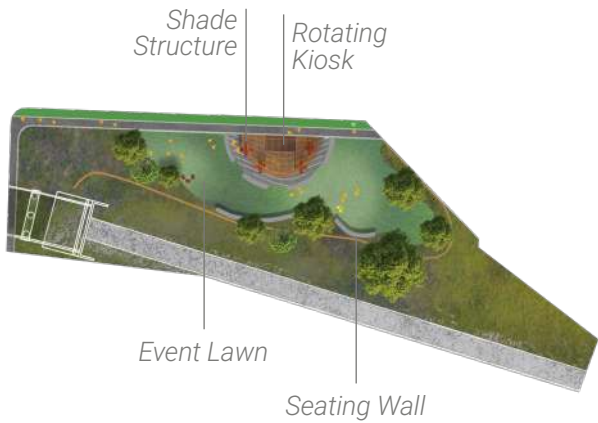
A central plaza provides café seating and flexible space for pop-up markets, allowing established businesses and emerging creatives to coexist. This approach aligns with Raleigh’s 2030 Comprehensive Plan goals for supporting local entrepreneurs and fostering a dynamic public realm.



Event Lawn

The southernmost block offers the only fully sunlit open lawn in the corridor, addressing a major gap in downtown Raleigh’s public space network. This flexible event lawn supports picnics, informal sports, and community gatherings.

A shaded structure houses a rotating food kiosk made from a repurposed shipping container, encouraging visitors to stay longer and enjoy refreshments. Together, the lawn and kiosk create a flexible, multipurpose space suitable for everyday use as well as programmed events.



9/3

Final Presentation



Graduate student presented two master plans for the space beneath the S-Line viaduct.

The final community reception and open house for Under the S-Line marked the culmination of a semester and summer long project in partnership with the NC State Pappas Real Estate Development Program. The presentation reviewed the full scope of work, including site inventory and analysis, precedent studies, and outcomes from the stakeholder engagement session.

Two design concepts, **The Living Line** and **The Raleigh Spine**, were presented in detail with an emphasis on how each responds to stakeholder values, visions, and needs. Each concept was displayed on large boards so stakeholders could review them up close.

The presentation concluded with an open forum for questions and comments, allowing stakeholders to share feedback and provide guidance for the future direction of the project. This discussion highlighted priorities such as pedestrian connectivity, retail activation, flexible recreation opportunities, and long-term maintenance strategies. The feedback gathered will inform next steps and potential refinements to the design concepts.



Both master plans were printed on display boards, allowing stakeholders to view them up close.



Following the final presentation, stakeholders were invited to share comments and questions.

Final Presentation

Who will champion the project?

The successful advocacy for the S-Line project relies on the collaboration and sustained efforts of several key stakeholder groups. Our research has helped to establish the project’s conceptual vision, and now a team with clear roles and contributions will be crucial in moving the project forward through the phases of funding, design, and implementation.

PRIMARY STAKEHOLDERS AND THEIR ROLES

City of Raleigh, including its Urban Projects Group, Transportation, Stormwater, Parks and Recreation, and Planning departments, would likely be the property lessor from NCDOT and will hold responsibility for the design, maintenance, and management of the public space.

NCDOT (North Carolina Department of Transportation) owns the land and manages the viaduct infrastructure. They will be a key partner involved in the opportunities and constraints around design and funding.

Amtrak may be involved to a lesser extent, as their primary scope is related to the trains running on top of the viaduct. We imagine they could be important advocates for the project nonetheless.

Downtown Raleigh Alliance (DRA) acts as the “instigator and advocate” that unites the various stakeholders. DRA was the originator of the research scope and initial funding.

Glenwood Neighborhood Association (GSNC) represents the interests of the local residents and businesses and acts as a champion and advocate as well as a community engagement and feedback partner.

Developers with large mixed-use and multi-family residential developments adjacent to the project are also involved and are potential financial supporters along with the City.

Adjacent Property and Business Owners and Local Residents were also engaged during the project to provide feedback and help inform the design concepts. These stakeholders would presumably continue to be involved in future phases

Our S-Line research has established a comprehensive vision for a public space that revitalizes the area beneath the elevated railway. This booklet documents our efforts to explore the design potential of this corridor.

The successful implementation of this vision now rests with the project’s stakeholders. Their continued engagement, collaboration, and advocacy are essential to transforming this conceptual work into a tangible reality. By uniting in their respective roles, they will carry the project through the critical phases of funding, design, and implementation, ensuring this vital public space benefits the community for years to come.

Appendix

Stakeholder questions and comments from the 9/3 final presentation.

DESIGN AND INFRASTRUCTURE

- “Did you consider (inside the curb) shortening pedestrian crossings at cross streets and West Street”?
- “What design limitations did NCDOT rail provide if any such as tree spacing and fences?”
- “How would site behave during 10-yr, 25-yr storm event? During smaller one inch event?”
- “Is there room for Pickle-ball courts to expand tennis courts? Should the Pickle-ball fall out of Vogue or in another spot?”
- “Are there any concerns about noise impact of the train on retail/recreation in this area?”
- “Have you considered having retail by at the intersection of Peace St. and also where it is currently placed in the concept between Tucker Street and W. North St?”
- “A really important crossing is a cross Peace Street to Smoky Hollow”.
- “The Raleigh spine creates an active complement to the passive amenity use of Smoky Hollow Park and generates revenue from the retail that can offset maintenance costs”.
- “I like the retail component, especially since Smoky Hollow Park is fully passive, but otherwise prefer the living line concept. The dog park seems like a huge amenity for the area”.
- “Kane should be a stakeholder, and hopefully a contributor given the amenity this becomes for its projects and other nearby developments”.
- “I really like the living line concept I think it matches well of the cities plan for the area north of here along capital and the soul of the city more generally also easier in some ways to

- implement and maintain”.
- “A mix of two the concepts would be nice for Pickle-ball court seems like a lot. How often is the current court used has the noise been considered”
- “I like the retail/café ideas/outdoor gathering spaces in general”.
- “I prefer a mix of both concepts: lots of nature, bike/ped connections, public gathering spaces, food truck retail, Pigeon House Branch as centerpiece of natural area”.

PROGRAMMING + MAINTENANCE

- “Activities of the two concepts should be analyzed along with the concept of Smoky Hollow Park for similar/contrasting amenities”.
- “What are ideas for how the landscape is maintained and who would do this?”
- “Role of programming – who will do this and how?”
- “What specific kinds of lighting would be used?”
- “It’s important to keep the DOT rail and the Amtrak involved/aware of the designs of progress”.
- “Surrounding major land owners should have a role in financing and programming the space”.
- “What are the top opportunities for phase one/ early activation?”
- “Who owns this land and who will maintain it once it’s built”?

