

LUMBERTON COMMUNITY FLOODPRINT PHASE TWO: OCTOBER 2020

LUMBERTON COMMUNITY FLOODPRINT

PHASE II: MEADOW BRANCH + SCOTTISH PACKING



www.coastaldynamicsdesignlab.com

OCTOBER 2020

CREDITS + THANKS

This report was completed by the NC State University Coastal Dynamics Design Lab in collaboration with faculty and students from the NC State University Department of Landscape Architecture and Environmental Planning, NC State School of Architecture, NC State Department of Biological and Agricultural Engineering, and North Carolina Sea Grant. All project activities and outcomes were made possible through a generous grant from the North Carolina Community Foundation. Support from the North Carolina Community Foundation has been instrumental in the Coastal Dynamics Design Lab's sustained presence in Lumberton since Hurricane Matthew in 2016.

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EXECUTIVE SUMMARY

Recent efforts undertaken by the Coastal Dynamics Design Lab (CDDL) have provided the City of Lumberton with design and planning technical assistance focused on land-use recommendations and design strategies for vacant parcels resulting from catastrophic flooding. The products of these efforts—Phases 1 + 2 of the Lumberton Community Floodprint—propose methods that strategically combine FEMA acquisition properties (i.e., “buyouts”) with existing parks and recreation assets to create a connected system of educational, recreational, and environmental amenities in areas that are otherwise vulnerable to environmental hazards, vacancy, and neglect. Outcomes of this research show strong potential to reduce flood risk and enhance public safety associated with repetitive flood-loss properties and improve long-term environmental function within historically flood-prone areas.

The research findings and recommendations generated in Phase 1 of the Lumberton Community Floodprint were disseminated to community leaders via a presentation to the Lumberton City Council (March 19, 2019). This presentation was the culmination of a year-long, collaborative research and planning process. The Phase 1 study informed key discussions with community leaders and, ultimately, served to generate interest in pursuing a select number of the report’s proposals. The primary outcome was the adoption of the Lumberton Loop Plan, including a request from city leaders, staff, and project partners to conduct additional research, engagement, and design assistance for two flood-impacted areas on the route. The two neighborhood projects include: **1) Meadow Branch Floodway Restoration adjacent to the Best Drive neighborhood, and 2) Repurposing the Scottish Packing Plant property into a recreation and environmental education amenity** associated with the Lumber River State Park and/or North Carolina Wildlife Resource Commission. These places and projects are the focus of this Phase 2 report.

Phase 2 of the Lumberton Community Floodprint completed research, engagement, design, and communication activities including but not limited to: [1] two community meetings in each project area (four total) that elicited participation and input from neighborhood residents and one meeting with city council/staff to present findings and recommendations for both projects; [2] hydraulic modeling and development of conceptual restoration

concepts for the Meadow Branch; [3] development of schematic design alternatives for both project areas to be used by the city as evidence/leverage for seeking larger implementation grants and to inform respective requests for proposals (RFPs); and [4] continued evaluation of issues and opportunities related to both Hurricane Matthew (2016) and Hurricane Florence (2018) impacts (i.e., FEMA flood map updates, incorporation of new property acquisition data, etc.), including associated updates and revisions to the Phase 1 Lumberton Loop Plan.

The goals of all processes undertaken and products delivered by the CDDL and its partners are to: [1] reduce the impacts of environmental hazards, specifically flooding; [2] increase public access to the benefits of nature and recreation; [3] meaningfully engage with local residents and regional stakeholders, including serving vulnerable neighborhoods through participatory activities; and [4] develop feasible, contextually appropriate and high-performing designs for each of the focus areas.

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a plan to reduce flooding

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reimagining a neighborhood landmark

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BACKGROUND

SETTING THE STAGE FOR PHASE TWO

Phase 1 of the Lumberton Community Floodprint addressed the devastation Hurricanes Matthew and Florence caused to the City of Lumberton. The project introduced the concept of a “floodprint”—an innovative landscape planning approach guided by water/land relationships, including the powerful forces of flooding, recovery, and equity. The place-based Floodprint process used landscape analyses and planning strategies to address: hazard mitigation and disaster recovery; social vulnerability; land and water conservation; policy, administration and finance; and natural resource management practices.

Phase 1 project outcomes created a roadmap to guide the city in its transformation of vacant parcels into places for water storage, habitat, and outdoor recreation. The unifying plan, coined the “Lumberton Loop,” connects over 806 acres and provides 8.5 miles of trails into a contiguous, community-wide greenway, of which 99% resides within the 100-year floodplain. Associated sub-area plans proposed in Phase 1 included short-, mid-, and long-range

improvement projects and management strategies. The processes and outcomes enabled through the initial Floodprint process continue to increase social and physical resilience in the city, specifically through actionable and scalable land-use strategies that reduce risk while simultaneously improving public safety and long-term environmental function within historically flood-prone neighborhoods. Phase 2 of the Lumberton Community Floodprint, which is the basis for this report, continues the efforts associated with two of the proposed sub-area plans, Meadow Branch and Scottish Packing. The following section of the report provides an overview of the Phase 1 research, analysis, and recommendations that led to the current Phase 2 scope of work.

HURRICANE MATTHEW

OCTOBER 2016

“ [Matthew] did its worst damage inland, causing [...] the worst flooding as a delayed effect in places that lie along major rivers and the macrame of small streams that look like tiny blue blood vessels on maps of Eastern North Carolina. As they filled with water draining from the landscapes upstream through the week after the storm passed, little creeks turned into rivers and rivers went Amazon. Of those riverside communities, Lumberton and surrounding Robeson County have seen the biggest disaster.” - The News & Observer, 2016

IMPACTS IN LUMBERTON

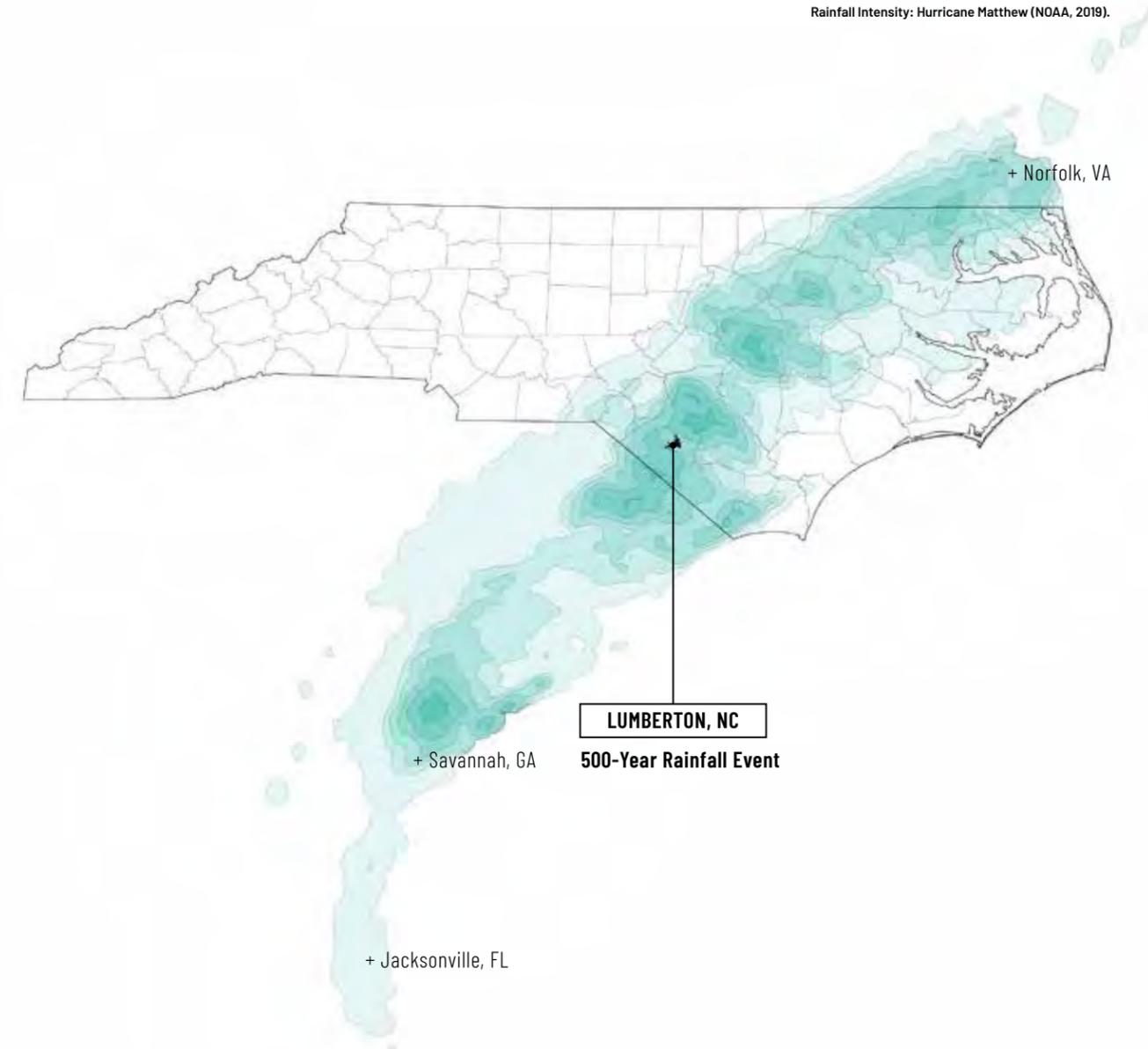
“Hurricane Matthew was an extraordinarily severe and sustained event that brought record-level flooding to many areas in eastern North Carolina’s coastal plain, sound, and coastal communities. Hurricane Matthew hit North Carolina on October 8, 2016, as a Category 1 storm. Communities were devastated by this slow-moving storm primarily by widespread rainfall. During a 36-hour period, up to 18 inches of heavy rainfall inundated areas in central and eastern North Carolina. Riverine flooding began several days after Hurricane Matthew passed and lasted for more than 2 weeks. New rainfall records were set in 17 counties in the Tar, Cape Fear, Cashie, Lumber, and Neuse River watersheds. Entire towns were flooded as water levels throughout eastern North Carolina crested well beyond previously seen stages. (Hurricane Matthew Resilient Redevelopment Plan: Sandhills Region, 2017).”

The effects of Hurricane Matthew were felt throughout the City of Lumberton. The amount of rainfall was equivalent to a 500-

year event in parts of the city, with riverine and stream flooding present in neighborhoods north, west, and south of downtown.

In addition to the numerous homes, businesses, and residents that were impacted by the storm, the city’s water treatment plant, Interstate-95, and many local roads were damaged and took weeks and months to repair. At the time of this reporting (October 2020), federal and state aid is still being distributed to the City of Lumberton and Robeson County as a result of Hurricane Matthew.

Rainfall Intensity: Hurricane Matthew (NOAA, 2019).



STORM STATISTICS



10.4" OVER 12 HOURS
Total Rainfall Recorded in Lumberton, North Carolina



\$1.14 BILLION
Total State + Federal Funds Spent on Recovery



4,826 CLAIMS
National Flood Insurance Program (NFIP) Claims Filed



50 COUNTIES
Federal Disaster Declarations in North Carolina



2,336 RESCUES
People + Animals Combined Total



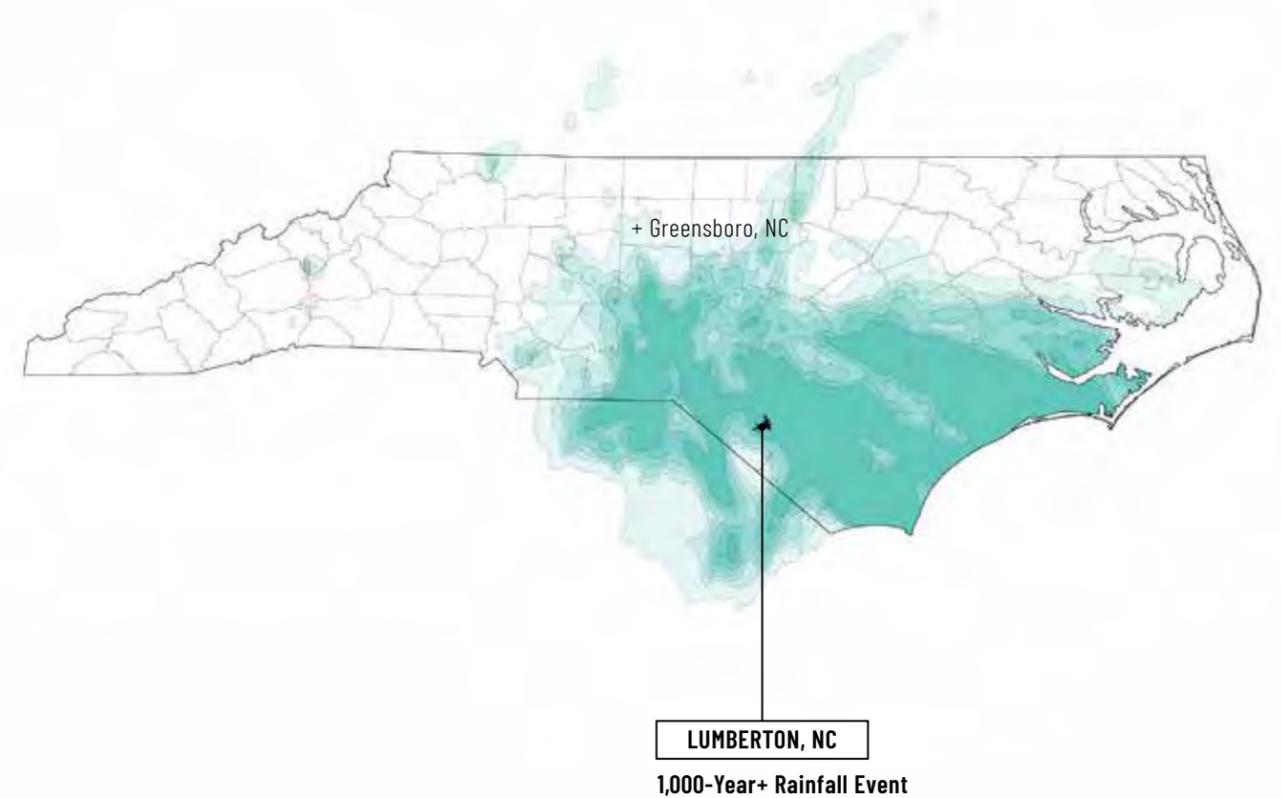
31 FATALITIES
Storm-Related Deaths in North Carolina

HURRICANE FLORENCE

SEPTEMBER 2018

Rainfall Intensity: Hurricane Florence (NOAA, 2019).

“In September 2018, Hurricane Florence came barreling toward Robeson County and eastern N.C. With the Category 4 storm halting on top of the state, [nearly two feet] of rain fell, flooding the same areas [as Matthew]. Freshly renovated homes were destroyed again. Rebuilt houses were ruined. The new paint on garages to cover up the watermark stains was useless, with murky brown water replacing the old marks. Low-income residents settled into new areas only to have those areas destroyed, too.” - The Charlotte Post, 2018.



IMPACTS IN LUMBERTON

“The rainfall intensity [from Florence], combined with the slow-moving southwest track of the system and large wind field contributed to historic flooding across Southeastern and Central North Carolina. The rainfall fed the Cape Fear, Lumber, and Waccamaw Rivers and led to intense riverine flooding, damaging infrastructure, homes, and businesses in the surrounding area. More than nine river gauges registered flood conditions greater than a 500-year event. The majority of damage caused by Hurricane Florence is due to this extended rainfall as the storm trekked southwest slowly through coastal North Carolina for six days.

combined (Hurricane Florence CDBG-DR Action Plan, North Carolina Office of Recovery and Resiliency, 2020).”

Lumberton once again saw the Lumber River shatter records, with many of the river’s tributaries breaching their banks, this time, even worse than experienced during Matthew. The long recovery timelines tied to Hurricane Matthew mitigation efforts now collided with another natural disaster, effectively turning back the clock on much of the recovery progress that had been made.

In addition to rainfall, Florence drove a record-breaking storm surge of 9 - 13 feet. The result of the storm surge, rainfall, and river overflow was catastrophic and life-threatening floods for a massive geographical extent of the State [...] the total storm impact has been estimated to be greater than the total damage caused by Hurricane Matthew (2016) and Hurricane Floyd (1999)

STORM STATISTICS



22.8" OVER 12 HOURS
Total Rainfall Recorded in Lumberton, North Carolina



\$2.03 BILLION
Total State + Federal Funds Spent on Recovery



15,253 CLAIMS
National Flood Insurance Program (NFIP) Claims Filed



51 COUNTIES
Federal Disaster Declarations in North Carolina



6,281 RESCUES
5,214 People + 1,067 Animals



45 FATALITIES
Storm-Related Deaths in North Carolina



Images after Hurricane Florence (all photos provided by: Lee Stevens, 2019).



BREADTH OF DAMAGES & THE NEED TO RESPOND

The extent of damages in much of Lumberton is directly correlated with the 1968 passing of the National Flood Insurance Act to create the National Flood Insurance Program (NFIP) by the U.S. Congress. This legislation allowed property owners in flood-prone areas to purchase affordable insurance against flood losses that private insurers were becoming less and less likely to cover. When a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in newly mapped Special Flood Hazard Areas (SFHAs), the federal government makes flood insurance available.

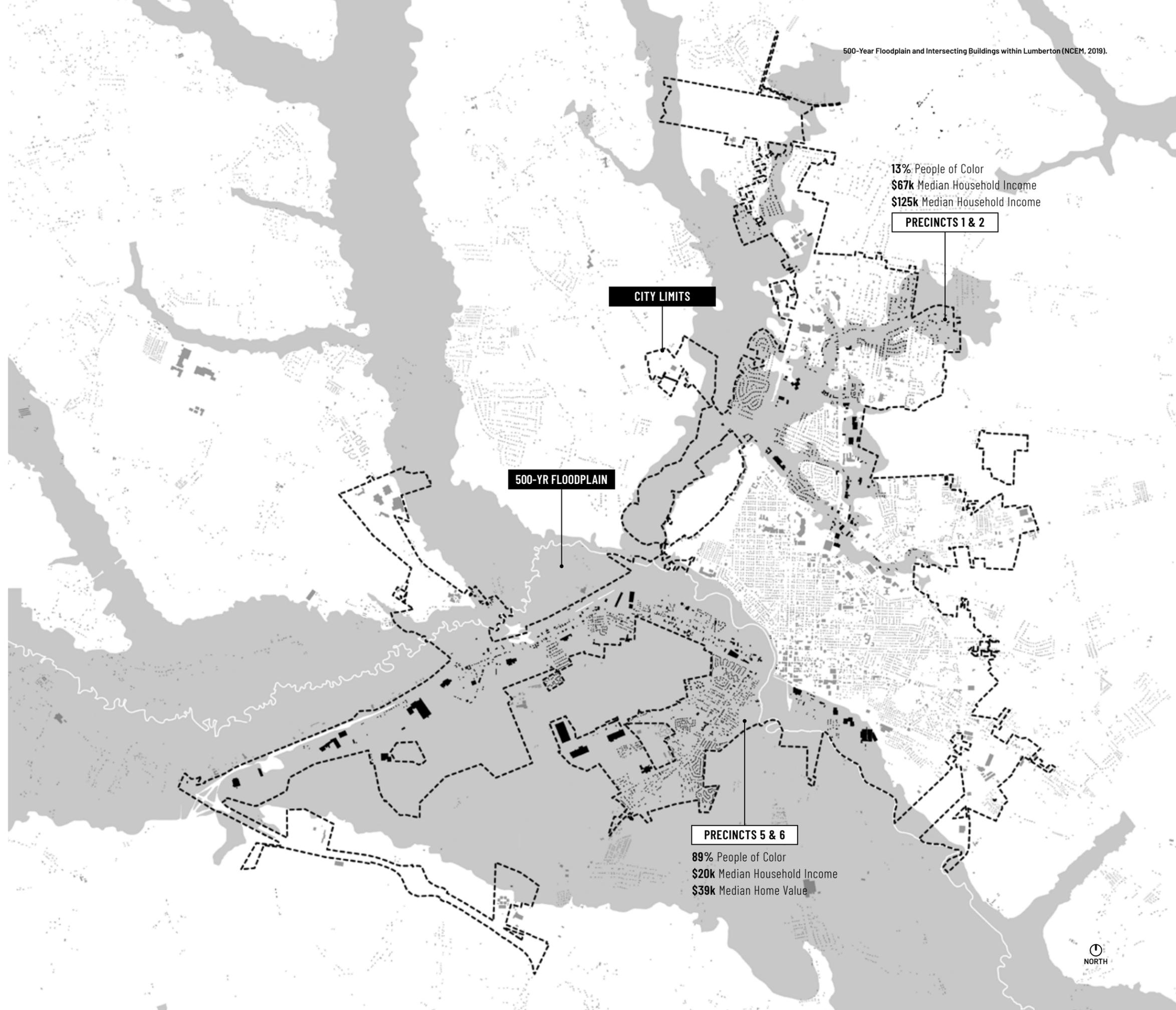
The City of Lumberton was quick to adopt the NFIP. By 1974, the city had already completed a Flood Hazard Boundary Map and a new management plan for the Jacob Swamp watershed (south of downtown), and was constructing an earthen levee to protect the area from future flooding. Like many parts of the U.S., these activities encouraged building, and rebuilding, in vulnerable areas that eventually exposed more people and property to catastrophic

flooding. Recently, the extensive flooding caused by Hurricanes Matthew and Florence have repeatedly proven these practices to be unsuitable and unsustainable.

The impacts of increased land development in low-lying areas have cumulatively led to a growing number of people living in environmentally vulnerable areas. This is problematic because increased land development typically results in the replacement of naturally porous, undisturbed areas with impervious, constructed surfaces such as pavements and buildings. In their natural state, vegetated areas capture and absorb rainfall, preventing it from entering nearby waterways. When these absorptive landscapes are replaced with impervious surfaces, rainfall is no longer able to infiltrate into the ground. Instead, rainwater quickly accumulates and runs off more rapidly, entering waterways that in turn feed larger waterways. The cascading effect of accumulated, unabsorbed stormwater leads to rising river levels, which inversely impacts citizens who have been incentivized to live in floodplains via the NFIP.

The breadth of damages shown in the above images captures a brief snapshot of the devastation experienced as a result of the NFIP program, including the flawed land-planning policies and practices that have ensued. It is no longer enough to simply build back what has been damaged. The threat of natural disasters, such as the increasing number of extreme precipitation events and the intensity of recent hurricanes, is projected to increase in the coming years and decades as the Earth's climate warms. Events like Hurricanes Matthew and Florence will not be the last to strike the Carolinas, and future climate-based calamities will only exacerbate societal disparities that are laid bare in the aftermath of such events.

This report focuses on proactive land-planning measures the city and its partners can undertake to help mitigate future risks that promote a more resilient and equitable community.



FLOODWATERS & VULNERABILITIES

As witnessed after both Matthew and Florence, flood risk is not distributed equally across communities, neighborhoods, or individuals. It is therefore important to look at a wide array of correlations between flood risk and social vulnerability indicators. For example, communities with large numbers of low-income households and people of color, among other factors, often find themselves in areas most affected by environmental stressors. These cumulative barriers increase in times of crisis, including hurricanes and floods. In Lumberton, these areas are most notably present to the south of the Lumber River, within its corresponding floodplains. These areas have long been artificially protected by a levee and lack other flood-control measures to counteract the environmental hazards that correlate with major flooding events. Consequently, these areas also represent some of the city's most demographically vulnerable populations. Additionally, Hurricanes Matthew and Florence caused extensive flooding along the river's smaller tributaries located north of downtown, which is said to have never previously occurred. Although they reside in the same city, these areas have vastly different demographic characteristics and described needs.

PLANNING STRATEGY

CONNECTING THE CHECKERBOARD

EXISTING + EXPECTED VACANCIES

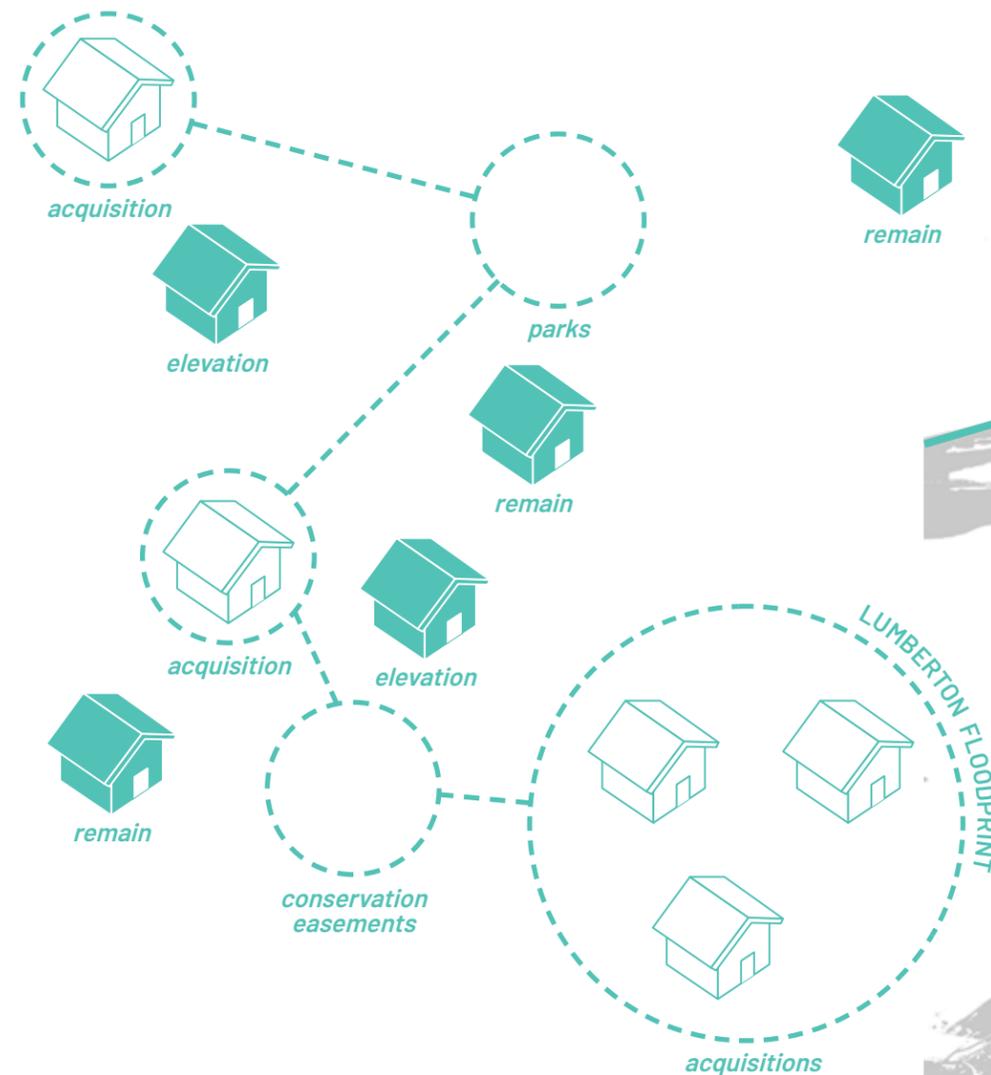
A unifying characteristic of flooded neighborhoods in both northern and southern portions of Lumberton is the emerging presence of vacant lots resulting from various mitigation and relocation efforts. Vacancy is mandated by governmental acquisition programs (commonly referred to as “buyouts”) and long-term, FEMA-connected policies. Upon acquisition, the deeds of buyout properties are transferred to local jurisdictions (i.e., towns, cities, and counties) with the restriction that they forever remain as open space (without

buildings or structures). A result of status-quo acquisition programs is a discontinuous checkerboard pattern of vacant parcels that fragments much of these flood-prone landscapes. In response to this deleterious condition, the underlying land-planning strategies nested within all phases of the Lumberton Community Floodprint are to: i) combine and consolidate clusters of vacant properties where they exist; and ii) connect them to existing, publicly accessible parks, conservation easements, and city/county/state-owned

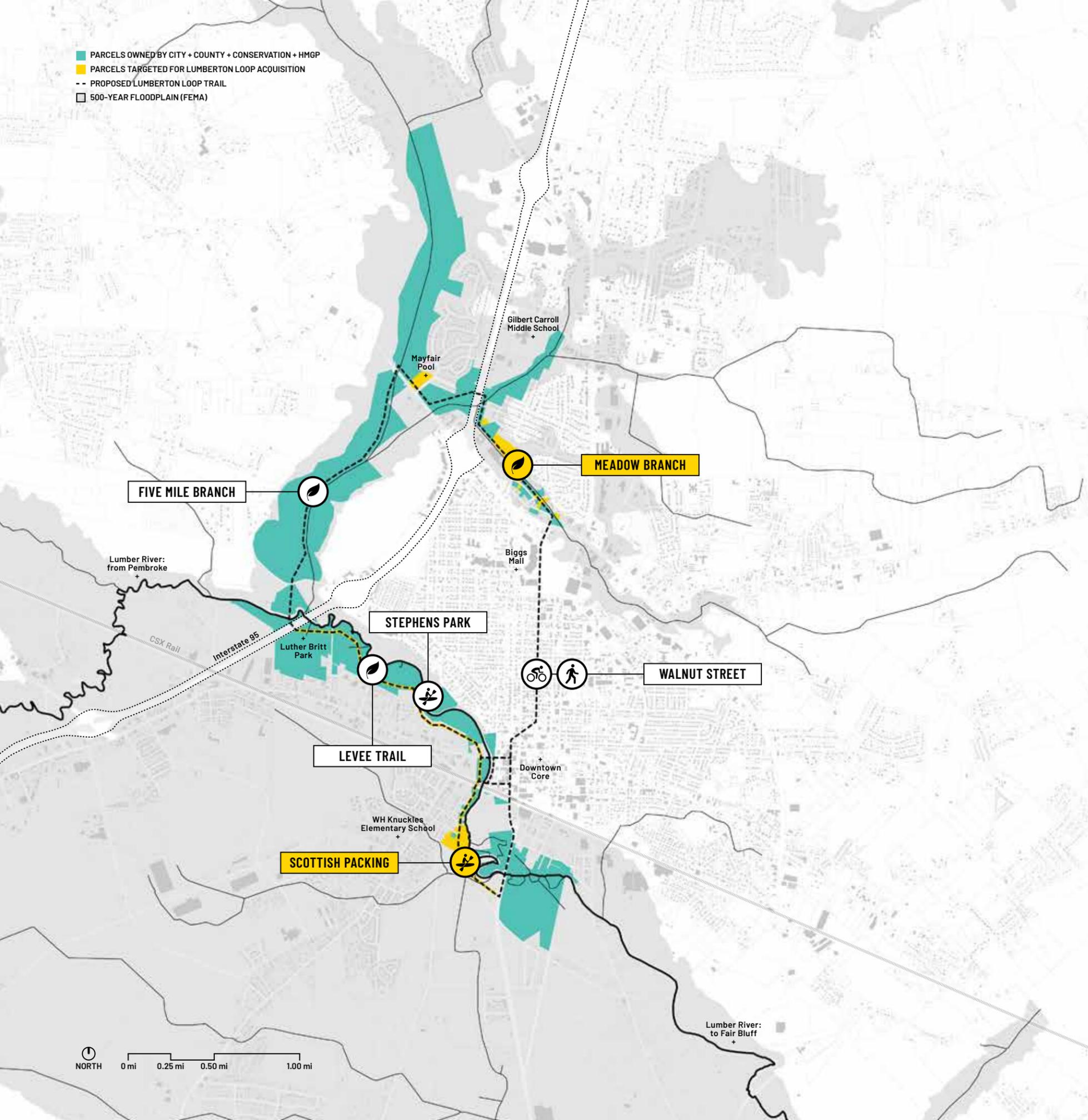
parcels. The intent is to create a citywide planning framework that comprehensively organizes cultural, recreational, and environmental assets within a series of park-like amenities.

This framework was initially developed and initiated during Phase 1 of the Lumberton Community Floodprint. Work completed in this initial study: i) analyzed all parcels in Lumberton to assess their environmental risks, socio-economic disparities, and recreational

opportunities; ii) identified vacant, municipally owned, and publicly accessible properties to combine with and enhance the function(s) of the city’s existing land-use strategies; and iii) proposed a select series of projects to incentivize new uses on vacant and/or high flood-risk properties in critical locations. The purpose of this Phase 2 report is to provide more detailed technical assistance for two of the proposed Phase 1 projects.



- PARCELS OWNED BY CITY + COUNTY + CONSERVATION + HMGP
- PARCELS TARGETED FOR LUMBERTON LOOP ACQUISITION
- PROPOSED LUMBERTON LOOP TRAIL
- 500-YEAR FLOODPLAIN (FEMA)



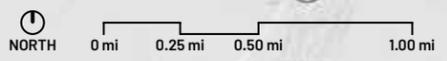
LUMBERTON LOOP: RECREATION AS MITIGATION

The highest and best use of land within a floodplain is to attenuate flooding through the capture, absorption, and slow release of rising waters. Due to these natural wetland functions, some members of the community commonly view floodplains as environmental hazards. However, these same areas hold the potential to serve as public amenities through the provisioning of active recreation and ecosystem services, especially when connected to lands already owned by the city, state, and conservation groups. While buyout parcels, conservation easements, and city/county parks in Lumberton are often located in environmentally sensitive floodplains, these existing land holdings are disconnected and presently incapable of providing an integrated, citywide nature-based amenity. Informed through robust analyses, the Lumberton Community Floodprint developed a citywide plan, coined the "Lumberton Loop", that consolidates these fragmented parcels into a connected whole to provide the city with a landmark recreational and flood infrastructure asset. The plan organizes 108 fragmented parcels into a citywide trail network that connects 806+ acres of vacant lands, over 99% of which are located in the 100-year floodplain.

8.5+
miles: trail

806+
acres

99%
floodplain



MEADOW BRANCH

A PLAN TO REDUCE FLOODING

From the Robeson County Hurricane Matthew Resilient Redevelopment Plan (ReBuildNC, 2017):

“Most of the homes along Best Drive in Lumberton were flooded during Hurricane Matthew and most of the homes that were flooded are in the floodway of Meadow Branch. Being in the floodway these properties are exposed to high velocity flows of water and debris. They are also routinely flooded and sustain damage from smaller rainfall events. This project would include the purchase and removal of homes in the Meadow Branch floodway and the development of a linear park along the banks of Meadow Branch. The result of this project would be the elimination of flood risk to people living in these homes, elimination of flood damage, improved conveyance along Meadow Branch and reduced flood risk for remaining residences. Additionally, improved quality of life for residents who are able to access the park.”

properties along Best Drive for a linear park. Expanding on these ideas, the goals of the Phase 2 effort were to: i) conduct hydraulic modeling to determine the efficacy of stream restoration and floodplain mitigation measures in reducing the localized elevation and extent of floodwaters along the Meadow Branch between Jerry Giles Park and I-95; ii) engage with neighborhood residents to gauge interest in applying for acquisition and determine programmatic preferences for recreational uses; iii) develop schematic plans that combine various mitigation measures with community-defined programmatic preferences; and iv) analyze property tax loss and maintenance costs resulting from property acquisitions and recommend planning schema for recouping these losses via municipal revenue streams.

As described above, there are many ecological, recreational, and economic advantages to repurposing a larger conglomerate of

BREACHING THE STREAM BANKS

More than two dozen homes located within the Meadow Branch floodplain have either completed HMGP Matthew acquisition or elevation, or are pending approval for HMGP Florence acquisition or elevation. These properties, and other occupied homesites adjacent to buyout parcels, are some of the most vulnerable to flooding in Lumberton due to their proximity to the Meadow Branch floodway. The recent catastrophic floods caused by Matthew and Florence have resulted in a bleak transformation of this once fully occupied neighborhood. The scattershot distribution of approved HMGP applications in combination with properties that have been abandoned by their owners has created a checkerboard condition of vacancy throughout the neighborhood. Recently, smaller flood events are reported to have breached the stream banks as well. These flood events have resulted in repetitive-loss damages to private property nearest the Meadow Branch and to public infrastructure, such as roads and bridges, near its channel. As made evident by post-Matthew and post-Florence aerial imagery, and in addition to testimonials from neighborhood residents, the Meadow Branch's propensity for flooding has increased in recent years.



Photo. 117 Fuller Avenue Prior to Demolition via HMGP.



Photo. Demolition from HMGP Matthew Acquisition.



MEADOW BRANCH: A NEIGHBORHOOD IN TRANSITION

Compounding the physical damage and psychological trauma caused by repeated floods, neighborhood disaster survivors describe an anxious sense of uncertainty associated with post-Matthew HMGP processes. These experiences and feelings were further exacerbated when Hurricane Florence struck, complicating and extending recovery timelines. In addition to the newfound realities of perpetual flooding along the Meadow Branch, neighborhood residents now report that the elongated recovery period created social hazards that did not exist prior to Hurricane Matthew. For instance, many of the remaining residents describe firsthand accounts of illicit activities, ranging from drug use to theft to prostitution, in a number of the neighborhood's vacant houses and surrounding public spaces.

Should a holistic plan for acquisition, relocation, and floodplain restoration not be implemented, the neighborhood surrounding the Meadow Branch is likely to suffer the same ill fate that has plagued many eastern North Carolina communities in the decades following

Hurricane Floyd (1999). In far too many cases, neighborhood parcels were acquired piecemeal and left without a meaningful vision for adaptive reuse afterwards. More than 20 years later these lands continue to lack productive, functional uses, thereby placing new economic, management, and safety burdens on the communities and environments in which they reside.

Homes along the Meadow Branch are currently being demolished as part of HMGP Matthew activities, and another round of demolition will ultimately take place as part of HMGP Florence activities. Because the neighborhood is in this state of flux, proactively developing a plan for both near-term and long-term land use changes is vital. A neighborhood-scale adaptation plan will guide outcomes toward creating public benefits on properties that may otherwise become public hazards.

Properties that are either i) city-owned; ii) being considered for conservation easements; iii) have been acquired through

HMGP processes; or iv) where owners have expressed interest in acquisition through Phase 2 workshops collectively equal 37+ acres of land along the Meadow Branch corridor. Advanced analysis, modeling, and planning enables this acreage to be re-envisioned for the purposes of floodplain restoration and/or enhanced public park access for surrounding residents.

SCOPE OF WORK

STUDY EXTENTS + OUTCOMES TO DATE



LAND DONATED

9.69 Acres on the West Side of Interstate 95 Deeded to the City



NCDOT ADVOCACY

On-Going Communications for Proposed Greenway Underpass



EASEMENT REQUESTED

Appraisal + Pending CWMTF Application with The Conservation Fund



EEG GRANT AWARDED

\$150,000 to City in Support of Acquisition and Implementation



INCREASED AWARENESS

12+ Property Owners Reaffirmed or Newly In Favor of Acquisition



HMGP + BRIC LOI'S SUBMITTED

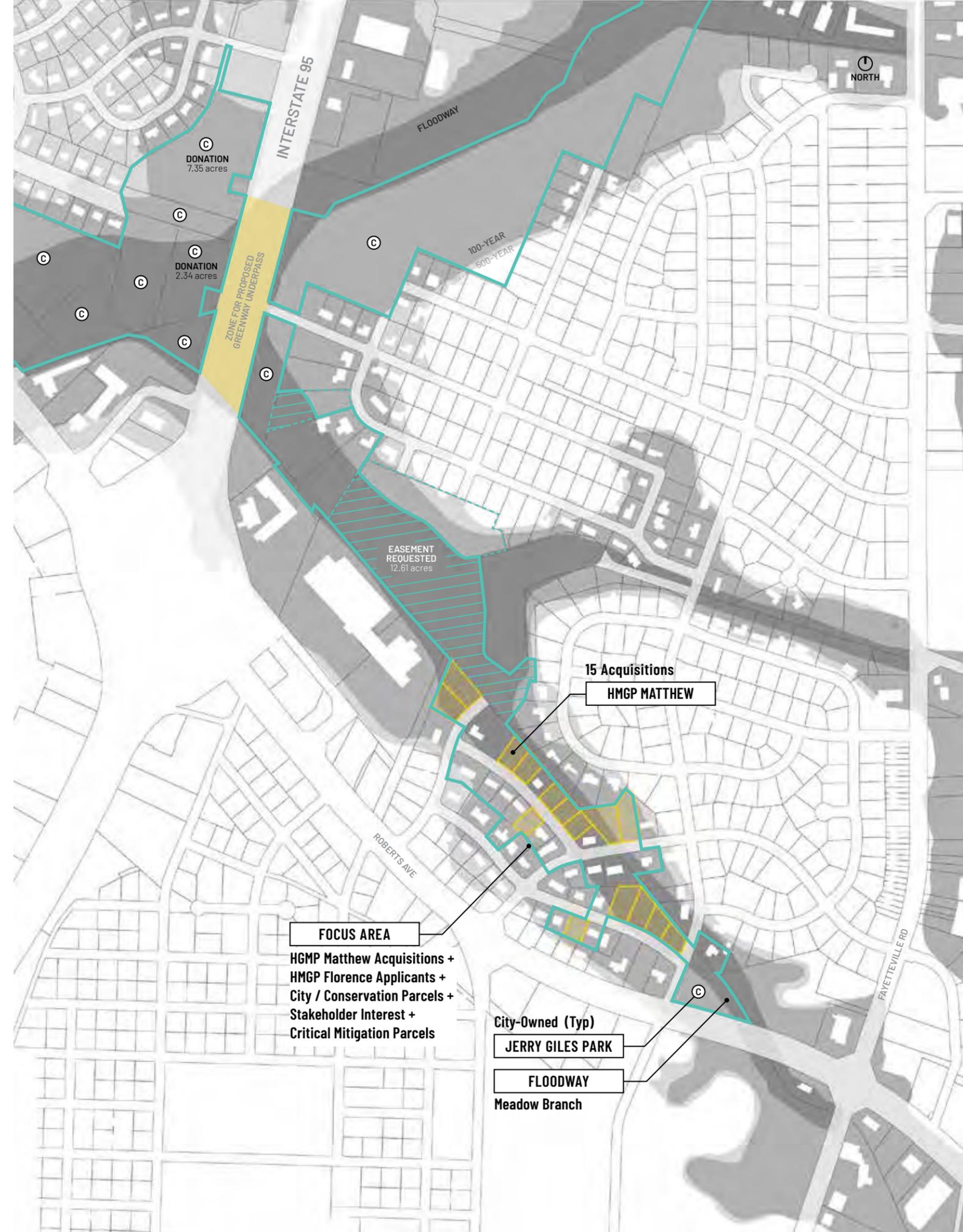
Funds Requested to Acquire Remaining Critical Parcels + Green Infrastructure

BUILDING CONSENSUS AND MOMENTUM

At the time of this reporting (October 2020), only HMGP Matthew acquisitions had been completed along the Meadow Branch. All of these acquired lots have been cleared and must be left as open space for perpetuity. There are, however, many additional homeowners who have either applied for acquisition via HMGP Florence, expressed willingness to accept a buyout if additional funds are available, or abandoned their home. To address the various issues experienced in the Meadow Branch / Best Drive neighborhood, the scope for this phase of work included:

- + **Hydraulic Modeling.** Used to assess the effectiveness of various flood mitigation techniques;
- + **Community Engagement.** Used to collect and inventory user preferences within the focus area;
- + **Schematic Design.** Used to build consensus around a unified set of strategies and action plans that are capable of creating a flood-resilient neighborhood.

To date, these processes have either directly led to or have contributed to several beneficial outcomes including: donation of 9+ acres to the city; advocacy and coordination with NCDOT regarding the feasibility of a greenway underpass associated with the reconstruction of I-95; a requested 12+ acre conservation easement working in partnership with The Conservation Fund; a pending Clean Water Management Trust Fund (CWMTF) grant application led by The Conservation Fund; an awarded \$150,000.00 North Carolina Environmental Enhancement Grant (EEG) led by the city; a submitted HMGP Letter of Interest to acquire remaining, critical parcels along the Meadow Branch co-written by the CDDL and the city; and increased environmental awareness as a result of the CDDL-led community workshops, where more than a dozen homeowners within this focus area either reaffirmed their willingness for property acquisition or were newly interested in doing so.



HYDRAULIC MODELING

SCENARIO ANALYSIS

Hydraulic models use stream data and mathematical inputs to analyze existing capabilities and predict future effectiveness of changes to stream systems. This study used a hydraulic model to evaluate existing and proposed flooding conditions along the Meadow Branch corridor. Model outputs visualized the flooding depth and extents of multiple proposed design interventions associated with various rainfall return periods. This information was then used to formulate specific land planning and infrastructure recommendations.

MEASURING IMPACT

AutoCAD Civil3D was used to develop a three-dimensional surface of proposed stream and floodplain restorations based on various floodway cross sections. The floodplain surface was then merged with LiDAR elevation data from the North Carolina Emergency Management Spatial Database for the surrounding upland to create a continuous digital elevation model (DEM) of the proposed restoration project. The new DEM was then imported to HEC-RAS and the cross section geometry was updated. A Manning roughness value of 0.09 was used for the floodplain and a value of 0.04 was used for the restored channel (Chow, 1959). These values are relatively conservative approximations to ensure that the estimated benefits will remain accurate as the channel and floodplain develop and the vegetation matures.

Several different restoration and infrastructure modification scenarios were evaluated using the HEC-RAS model. These different concept-level scenarios were run to determine the relative impacts of floodplain restoration and road crossings on backwater and flooding

along the Meadow Branch. The results were evaluated by examining the decrease in water surface elevation (WSE) and spatial extent of flooding for the range of flood return periods included in the HEC-RAS model (5-, 10-, 25-, 50-, 100-, and 500-yr events). The model was run as steady state simulations (i.e., the model is approximating the maximum water surface elevation and does not route the entire storm hydrograph through the stream). While steady state models are not always as accurate as unsteady models, they provide a conservative prediction of peak WSE. The North Carolina Floodplain Mapping Program uses steady state models to produce the state's floodplain maps. In addition, note that backwater from the Lumber River during extreme events was not included in these simulations. The modeling scenarios that were evaluated include: Crossings Removed; Floodplain Restoration Only; Restoration and Crossing Modifications (which includes future modifications to I-95).

SCENARIO ONE

ROAD CROSSING MODIFICATIONS ONLY



NO SIGNIFICANT BENEFIT

The HEC-RAS simulations for Scenario One are shown above for 5-, 10-, 25-, and 100-year events. Conditions modified for this scenario include:

- 1) Increased culvert dimensions at Interstate-95 and the Meadow Branch.
- 2) Removed or reconfigured stream crossings at:
 - i) Highland Avenue and the Meadow Branch,
 - ii) Walnut Street and the Meadow Branch, and
 - iii) Jerry Giles Park walking bridge and the Meadow Branch.
- 3) No alterations to the Meadow Branch channel or floodplain.

Removing flood-prone segments of Highland Avenue, Walnut Street, and the Jerry Giles Park walking bridge resulted in only a marginal (less than 0.1-ft) change in Water Surface Elevation (WSE). There would be minimal change in WSE for the 5- and

10-year events if the size of the Interstate-95 culvert were also increased, with the mapped flood extents for 25- and 100-year return periods being nearly mirrored for the existing (yellow) and proposed (teal) conditions.

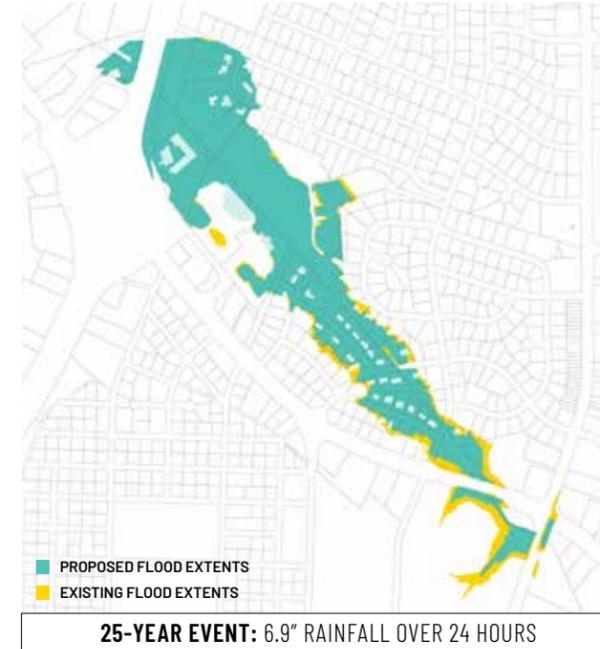
These results show that the upstream crossings have minimal impact on flooding. This indicates that even if the stream crossings were replaced with either higher capacity culverts or bridges, over-topping would still be a problem, even for low return period events (e.g., 5- and 10-yr events).

The findings indicate the existing Meadow Branch channel capacity is not adequate to convey the current discharge for these rainfall events. The results also show that the Interstate-95 culvert causes a backwater effect upstream, particularly for higher return period events. Overall, these results show that modifying the stream crossings would not reduce flooding, even for low return period events, and that

additional floodplain conveyance is needed to produce a measurable impact on observed levels of flood extents and flooding depth for the properties immediately adjacent to the Meadow Branch.

SCENARIO TWO

FLOODPLAIN RESTORATION ONLY



BENEFIT FOR 5- AND 10-YEAR EVENTS

The HEC-RAS simulations for Scenario Two are shown above for 5-, 10-, 25-, and 100-year events. Conditions modified for this scenario include:

- 1) Floodplain restoration activities within the bounds of existing and proposed acquisition properties along the Meadow Branch; including a 200-foot buffer for implementation.
- 2) No alterations to the culvert dimensions at Interstate-95 and the Meadow Branch.
- 3) No removed or reconfigured stream crossings at Highland Avenue, Walnut Street, or the Jerry Giles Park walking bridge.

This scenario was modeled to determine if floodplain restoration alone can alleviate flooding, or if modifications to the road crossings are also required to reduce flooding. Results show that for the 5-year event, there is a substantial drop of

approximately 2-feet in the Water Surface Elevation (WSE) at Highland Avenue. This reduction in WSE declines traveling downstream, closer to Interstate-95, as the backwater effects of the Interstate culvert increase.

The reduction in WSE diminishes for higher return period events (i.e., the drop in WSE is greater for the 5-year event than the 25-year event). For the 10-year event, overtopping of Highland Avenue can likely be prevented, however, Walnut Street is still likely to overtop during the 5- and 10-year events in both existing (yellow) and proposed (teal) conditions. Both road crossings are shown to overtop for the 25- and 100-year events.

These results indicate a measurable, significant benefit in the observed flood extents and flooding depth for the 5- and 10-year return period events from floodplain restoration only. While the proposed impacts of flooding are greatly diminished for 25-year and greater return period events, the

overall benefit to properties adjacent to the Meadow Branch is shown to be greater than Scenario One.

SCENARIO THREE

RESTORATION & MODIFIED ROAD CROSSINGS



BENEFIT FOR 5-, 10-, AND 25-YEAR EVENTS

The HEC-RAS simulations for Scenario Three are shown above for 5-, 10-, 25-, and 100-year events. Conditions modified for this scenario include:

- 1) Elevated bridge span at Interstate-95 and the Meadow Branch.
- 2) Removed or reconfigured stream crossings at:
 - i) Highland Avenue and the Meadow Branch,
 - ii) Walnut Street and the Meadow Branch, and
 - iii) Jerry Giles Park walking bridge and the Meadow Branch.
- 3) Removed extent of Best Drive.
- 4) Floodplain restoration activities within the bounds of existing and proposed acquisition properties along the Meadow Branch; including a 200-foot buffer for implementation.

The most notable feature of this scenario, the elevated section of Interstate-95 at the Meadow Branch, is part of the current

North Carolina Department of Transportation (NCDOT) planning efforts to elevate the interstate and modify stream crossings along the Lumberton corridor. The current NCDOT plan no longer includes a raised bridge segment, and instead proposes a series of enlarged culverts at the Meadow Branch. NCDOT is currently working on modeling different design scenarios for this area and is likely to begin construction in 2022-2023. While the plans for this project are not yet complete, it is anticipated that the carrying capacity of these crossings will be substantially increased. Scenario Three, as modeled, includes this anticipated change to I-95 and provides the most holistic projection of the infrastructure improvements required in this area.

Modeled simulations, shown above, indicate that **Scenario Three shows similar reductions to Water Surface Elevation (WSE) as in Scenario Two for lower return periods (i.e., more frequent). Scenario Two only modeled floodplain restoration activities. However, Scenario Three showed a decline in WSE**

for the 25-year event in the range of 1.5 to 2.0 feet downstream of Highland Avenue and about 0.5 to 1.0 feet upstream of Highland Avenue as compared to other modeled projections. Lastly, Highland Avenue is no longer likely to overtop up to a 25-year event.

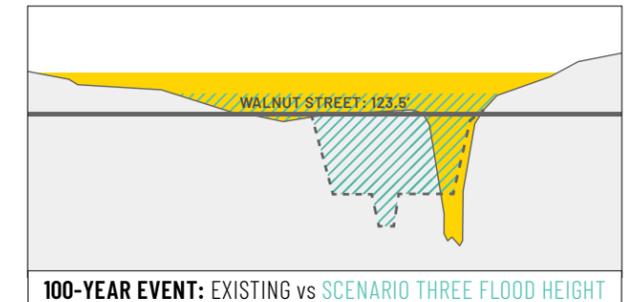
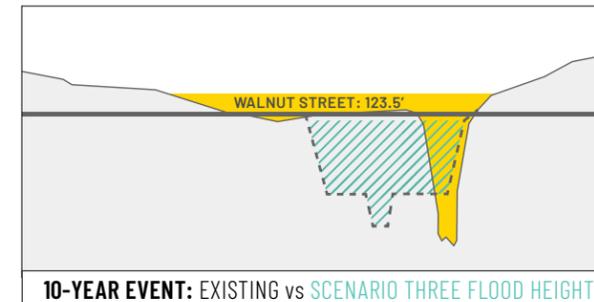
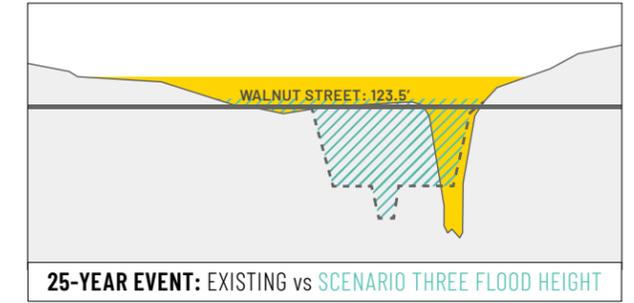
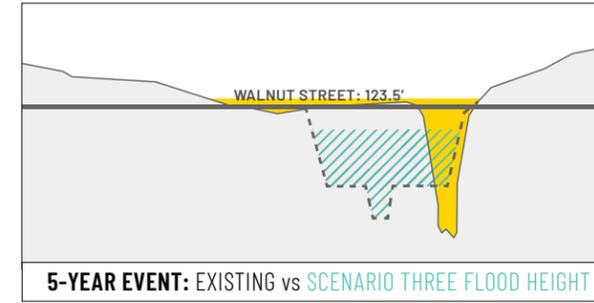
Scenario Three also provides benefits in a 100-year event, reducing peak WSE to below the level of the existing 25-year event. However, this assumes no backwater from the Lumber River. There is a strong likelihood of backwater effects during hurricanes or other extreme precipitation events of similar magnitude. For example, during Hurricane Florence the USGS recorded high-water marks of 125 feet to 126.5 feet near Interstate-95 and the Meadow Branch (USGS, 2019). In summary, this means that large storm events producing significant backwater from the Lumber River will negate the modeled Scenario Three flood reduction benefits.

SUMMARY OF FINDINGS

RECOMMENDATIONS FOR THE STUDY AREA



WALNUT STREET AT MEADOW BRANCH CROSSING: EXISTING CONDITION



SUMMARY + RECOMMENDATIONS

For low return period storms (i.e., more frequent), flooding along the upstream section of the Meadow Branch can be reduced through floodplain restoration alone. However, this is not the case for higher return period events (i.e., less frequent). Restoration alone can prevent overtopping of Highland Avenue during the ≤ 10 -yr event.

Modification to the upstream road crossings at Highland Avenue and N. Walnut Street has negligible impact on Water Surface Elevation (WSE). North Walnut Street continues to overtop in 5-yr events and Highland Avenue overtops in 10-yr events. Additionally, modifying the I-95 culvert has an impact on WSE, but only for the downstream end of the Meadow Branch.

The combination of floodplain restoration and crossing modifications to Highland Avenue and N. Walnut Street will not prevent overtopping at the N. Walnut Street bridge in the 5- and 10-yr events. Therefore, N. Walnut Street was removed from the

model due to the continued public safety risk and the presence of alternative travel routes.

These modifications reduce WSE by 2.0 to 3.0 feet upstream of Highland Avenue in a 5-yr event. WSE reduction benefits decline downstream due to the backwater effects of I-95. In the 10-yr event, WSE declines by approximately 2.0 feet upstream of Highland Avenue. Once again, the reduction benefits decline downstream of Highland Avenue due to the backwater effects of the existing I-95 culvert. The reduction in WSE is much less for ≥ 25 -yr rainfall events. Highland Avenue still overtops in the 25-year event.

Additional flood reduction benefits will be realized when the existing I-95 culvert is replaced with increased culvert sizes that accommodate modeled flows (as a component of elevating I-95). Reductions in WSE will increase for higher return period events. There will be minimal additional benefits for the 5-yr event (< 0.2 -ft)

and only slightly greater for the 10-yr event (< 0.6 -ft) compared to the Restoration and Crossing Modifications scenario. The greatest reduction in WSE is realized in the 25-yr event, where reductions in WSE will range from 1.0 to 2.0 feet beyond the level of the Restoration and Crossing Modifications scenario. After these modifications, Highland Avenue will likely no longer overtop in the 25-yr event. The declines in flooding extent will also be substantial.

Results for the modeled 100-yr event should be interpreted with caution. Backwater from the Lumber River during extreme events will likely limit any potential reductions in WSE gained from restoration.

- Recommendations resulting from the hydraulic analysis include:**
- i) Complete stream and floodplain restoration.**
 - ii) Remove N. Walnut Street crossing and pedestrian bridge.**
 - iii) Increase the capacity of the crossing at Highland Avenue.**

Other considerations to note include:

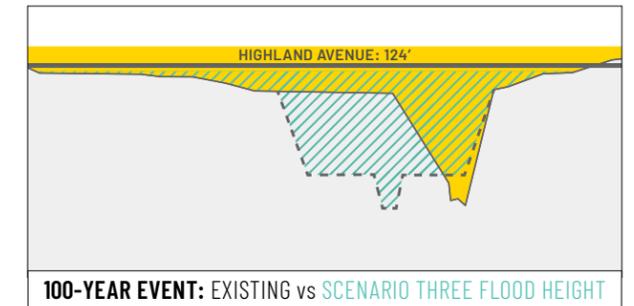
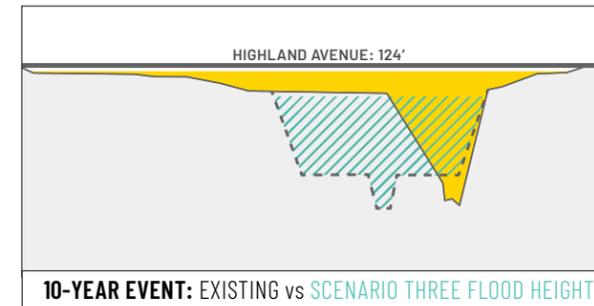
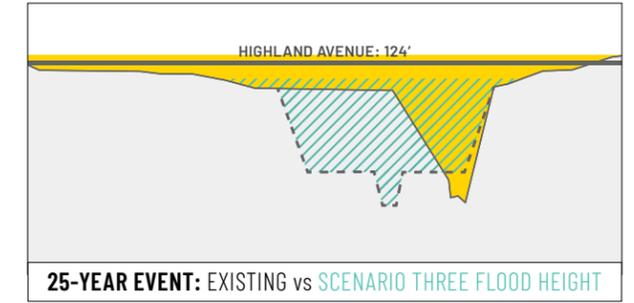
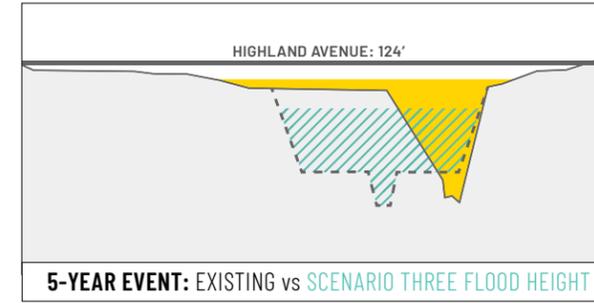
- i) Additional floodplain width has minimal impact on WSE. Therefore, the differences between various future floodplain restoration schemes will largely relate to the configuration and use of associated upland greenspace.
- ii) The modeling effort was a feasibility study conducted at a concept level, therefore engineers should conduct more detailed modeling during the design of the restoration project.
- iii) The design requires further refinement, including multiple iterations to determine the optimal floodplain width.
- iv) Any stream and floodplain restoration along the Meadow Branch needs to include the relocation and/or removal of existing utilities.

SUMMARY OF FINDINGS

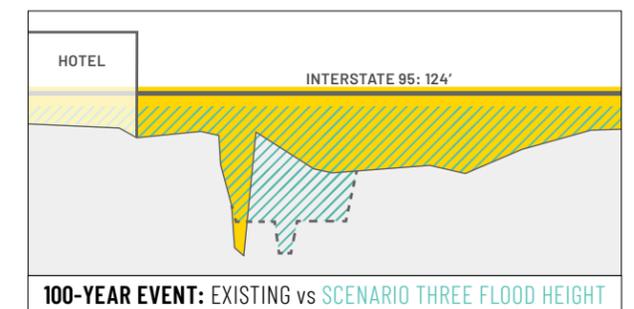
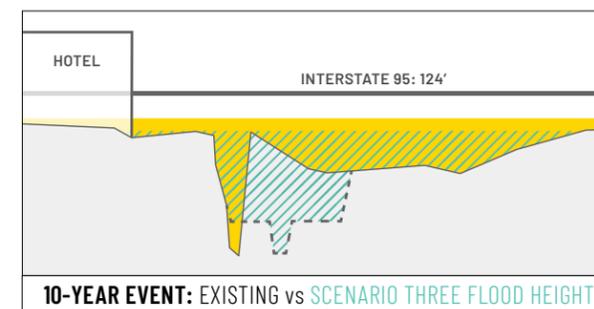
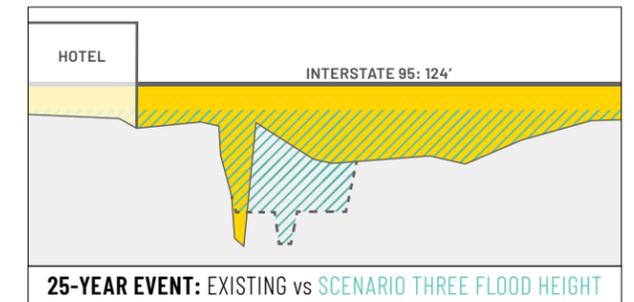
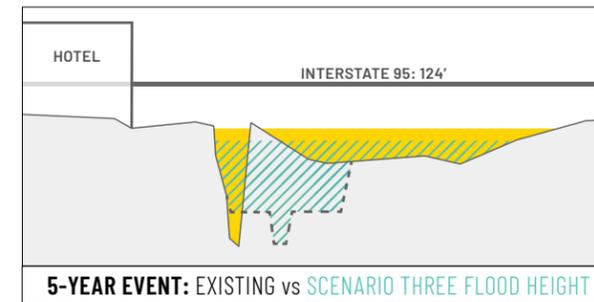
RECOMMENDATIONS FOR THE STUDY AREA



HIGHLAND AVENUE AT MEADOW BRANCH CROSSING: EXISTING CONDITION



BIG LOTS / HOTEL AT MEADOW BRANCH: EXISTING CONDITION



COMMUNITY OUTREACH

MEADOW BRANCH

Community engagement can play a critical role in strengthening social cohesion by creating opportunities for citizens to gain awareness of opportunities and threats, participate in resiliency efforts, and increase their community networks through participation in shared activities. Engagement activities for the Meadow Branch focus area focused on building resident awareness of flood risks and enabling the project team to better understand neighborhood desires related to future public green spaces.

RESIDENT ENGAGEMENT

The project team worked closely with city staff to create engagement plans and develop public meeting communication materials. Engagement activities were also coordinated with council members and community leaders from the two precincts (Precinct 1 and Precinct 2) that represent the Meadow Branch project area boundaries. The City Manager, Deputy City Manager, and City Attorney reviewed workshop materials and attended meetings to express their support and answer questions pertaining to the city.

The project team engaged twice with neighborhood residents living near the Meadow Branch and once with the City Council, including:

Meeting #1 (October 8, 2019): Initial listening session with residents, area stakeholders, agency partners, and representatives from the project team. The community meeting included city staff that presented findings from past projects and introduced the current project. Activities focused on listening to resident needs, wants,

issues, and opportunities related to current recovery processes as well as creation of future green spaces.

Meeting #2 (December 11, 2019): Presentation of three (3) Meadow Branch restoration design alternatives. Multiple design alternatives were presented and discussed to build consensus around a preferred schematic design.

Meeting #3 (August 5, 2020): The project team's plan for a third community meeting was suspended due to the onset of the COVID-19 pandemic and associated, state-mandated orders restricting public gatherings. The final planning recommendations and design alternatives produced as a result of the two public workshops were, however, presented (via videoconference) to Lumberton City Council and staff. The preferred scenarios and recommendations contained within this report were finalized based on the positive feedback received from council members and staff.

Picture: Meadow Branch Workshop #2.



MEETING ONE

LISTENING SESSION



GOALS, STRUCTURE & RESULTS

The activities conducted in the first community meeting focused on listening to residents. The objective was to gain an understanding of neighborhood needs, wants, issues, and opportunities related to current recovery and acquisition processes, as well as creation and care of future green spaces. Most specifically, the project team led interactive activities to: i) ascertain homeowner attitudes toward HMGP acquisition programs and procedures, and ii) gather resident ideas and/or concerns related to repurposing vacated parcels along the Meadow Branch corridor.

This meeting was structured to facilitate conversations between neighborhood residents, area stakeholders, and the project team. Workshop materials focused on the topics of community life, existing challenges, and future desires. The project team guided and documented these conversations through small group break-out sessions. By the end of the workshop, all community participants had the opportunity to voice their opinions on the

above-mentioned topics as they relate to the neighborhood's changing landscape.

Thematically, concern was consistently expressed pertaining to the current neighborhood fragmentation resulting from HMGP-related demolition and lot-clearing activities. Uncertainty about the stability of property values and of public safety was reiterated across all groups. There was, however, significant aspiration voiced regarding the potential of new park spaces to mitigate the severity of future floods. Additional interest was expressed for solutions capable of alleviating existing public/private use conflicts caused, in part, by high traffic volumes along roadways within and around the study area. Lastly, passive recreational amenities (i.e., walking trails) were viewed as highly compatible with, well-suited to, and desired by the surrounding neighborhood.



TOPIC: COMMUNITY LIFE

Question: What are aspects of the neighborhoods surrounding Meadow Branch, both past and present, that are important for the project team to be aware of?

Most Common Responses:

- + Loss of Property Value Due to Flooding
- + Vacancy "Feels Dead" / "Eerie"
- + Neighborhood Fragmentation
- + Uncertain of Neighborhood Future



TOPIC: EXISTING CHALLENGES

Question: What challenges exist that might prohibit the vacant properties around Meadow Branch from becoming a successful community space?

Most Common Responses:

- + Safety Threats and Illicit Activity
- + Need Public / Private Buffers
- + Traffic Calming Needed
 - Highland and Walnut as Cut-Thrus
 - Crossing into Jerry Giles Park
- + Proper Maintenance / Upkeep



TOPIC: FUTURE DESIRES

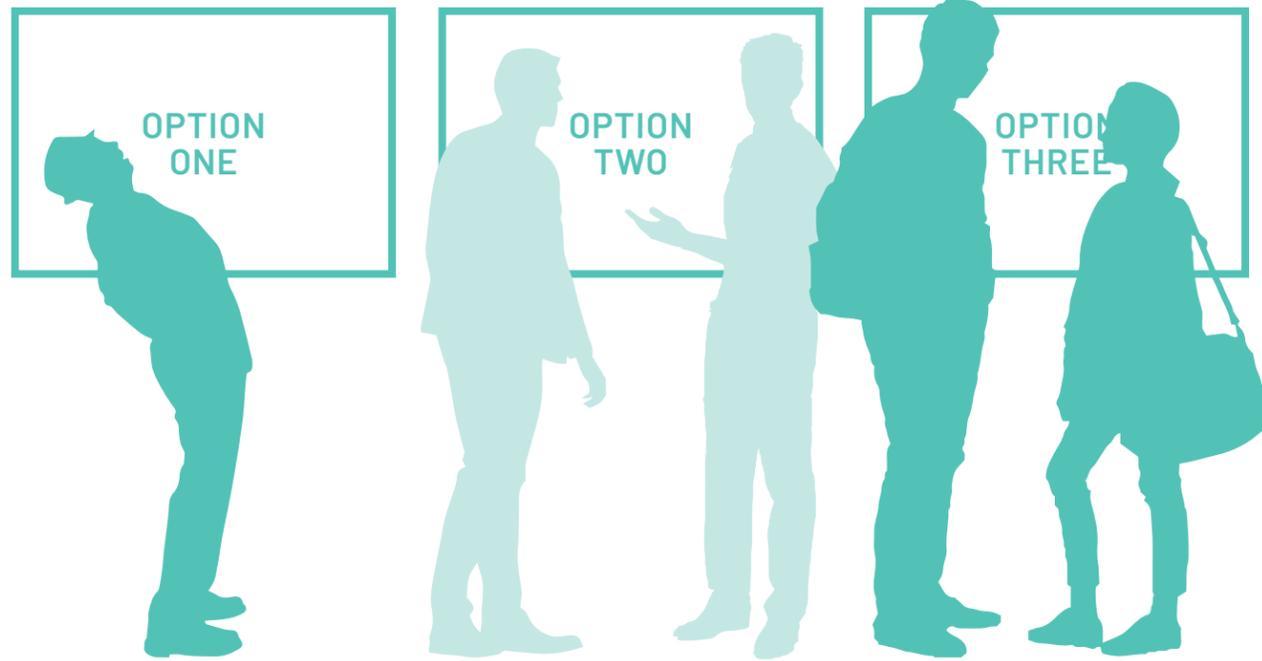
Question: What does 'community space' mean to you? How might a future community space engage with aspects of your daily life?

Most Common Responses:

- + Walking Trails / Exercise
- + Pet-Friendly
- + Playgrounds
- + Quiet / Safe for Gathering
- + Outdoor Eating / Gardening
- + Flood Control
- + Adequate Parking

MEETING TWO

DESIGN ALTERNATIVES WORKSHOP



GOALS, STRUCTURE & RESULTS

The second community meeting shared with neighborhood residents the results of the hydraulic analysis and presented three (3) schematic design alternatives that: i) responded to issues and opportunities expressed during the first listening session; and ii) generated participant feedback via voting on a preferred alternative. Resident voting served as a method of building consensus around a preferred schematic design.

Of the three alternatives presented, there was overwhelming preference for the most holistic proposal titled: "Restoration and Crossings Focus." This plan called for the conversion of the largest quantity of parcels into a restored stream corridor. This plan also proposed decommissioning several flood-prone segments of roadways.

Collectively, the documented voting results and anecdotal conversations recognized this plan as the preferred alternative due to its: i) high potential to reduce future impacts of flooding;

and ii) opportunity to reduce usage of neighborhood roads as cut-thru travelways for non-resident vehicles, thereby lessening pedestrian/vehicular conflicts via a reconfigured road network.



OPTION ONE: RESTORATION FOCUS

9%



OPTION TWO: CROSSINGS FOCUS

0%

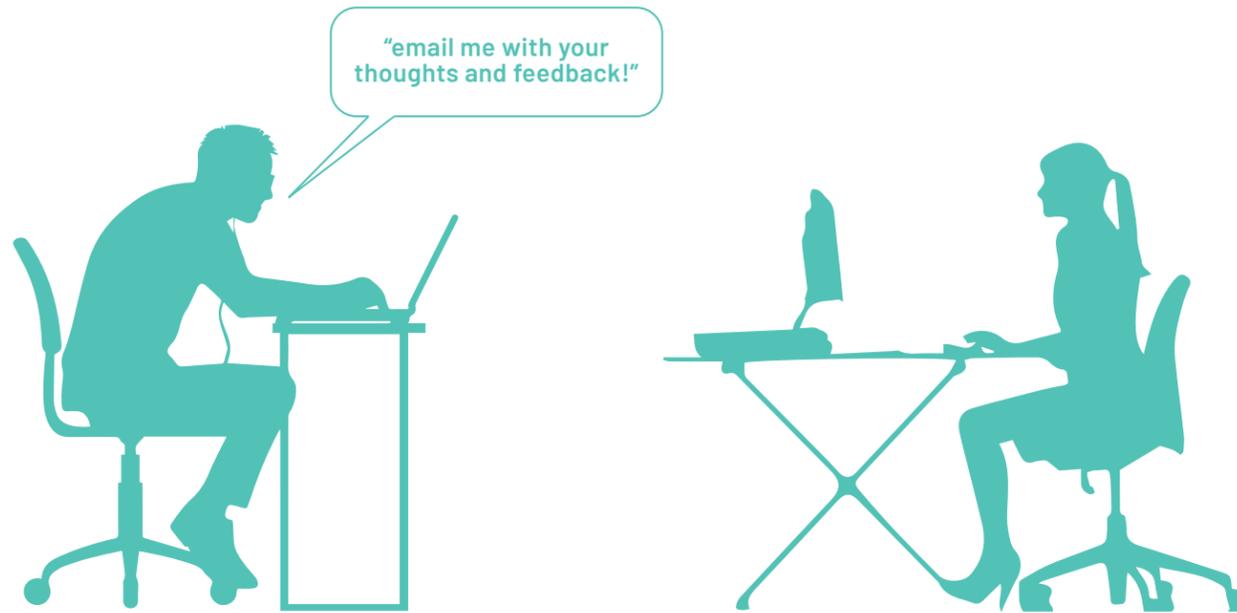


OPTION THREE: RESTORATION + CROSSINGS FOCUS

91%

MEETING THREE

PRESENTATION TO CITY COUNCIL



GOALS, STRUCTURE & RESULTS

The purpose of the third meeting was to present research findings, planning recommendations, and preferred schematic designs. Due to COVID-19 restrictions on physical gatherings, this was conducted via an online, digital presentation as part of a Lumberton City Council public meeting.

During this meeting, the project team also updated elected officials on the status of additional, associated project outcomes, either completed or pending. The following is an excerpt from the published City of Lumberton meeting minutes:

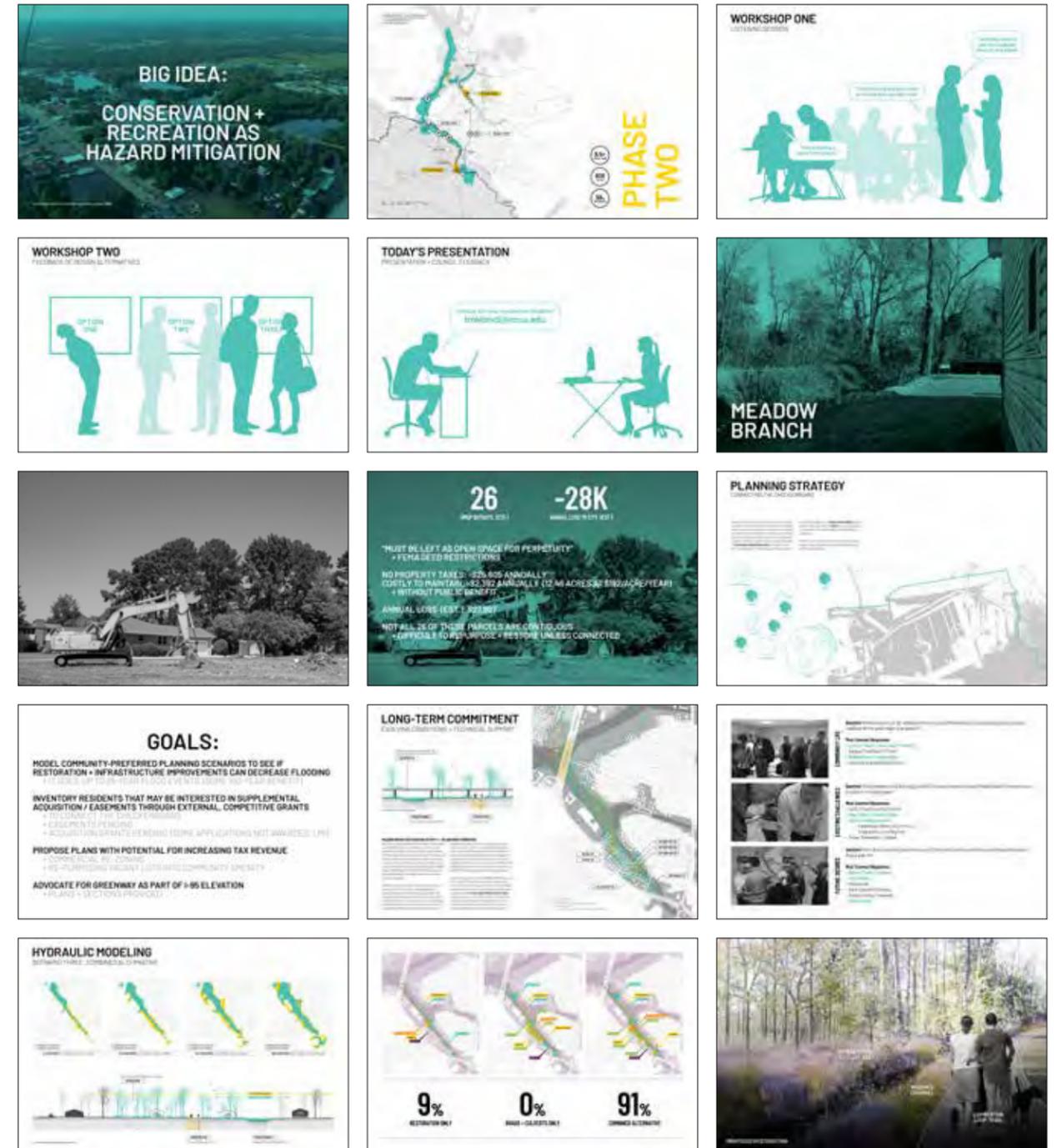
“Deputy City Manager Brandon Love introduced Andrew Fox and Travis Klondike from NC State University Coastal Dynamics Design Lab to the Council. Mr. Fox and Klondike gave a brief presentation on the work that they have done thus far as it pertains to the design proposals for repurposing the existing and the expected buyout parcels along Meadow Branch and Best Drive. They talked about the Interest Meetings that they had with the citizens and

what interest that showed in the revamping of Scottish Packing property in South Lumberton and the most popular turned out to be an Educational Focus.

They stated that this project is fully funded through the NC Community Foundation at no cost to the City. They also thanked Brandon, Wayne, Holt and Brian Nolley along with Councilmen Cantey, Howard, and Rising and Councilwoman Robinson for their assistance with the plan.

Deputy City Manager Love thanked Mr. Fox and Klondike for wanting to come in and offer their help. He stated that several others have come and offered assistance; however, NCSU by far has done more than any other group, even identifying funding.”

SELECT PRESENTATION SLIDES





CONCEPTUAL DESIGN

PURPOSE + INTENT

Design schemes were created by combining recommendations from the hydraulic analysis with community-defined preferences for land planning and recreational amenities. These schemes are intended to be used as a blueprint to guide the city in reconstructing and restoring areas surrounding the Meadow Branch. Overall, the plan illustrates short-term solutions that also strategically fit within longer-term recovery initiatives, such as elevating I-95 and the Lumberton Loop. Material quantities of various features are provided to assist with budget creation.

CONSOLIDATING RECOMMENDATIONS

Due to the extended, multi-year timelines associated with HMGP-related processes, it became necessary to split the preferred schematic alternative into two phases of implementation, short-term and long-term. The initial, short-term phase better responds to existing conditions, while long-term phasing acknowledges that many more buyouts are pending and expected in the coming years due to ongoing Hurricane Florence HMGP processes.

As proposed, short-term actions support the long-term plan without requiring renovation or replacement of any elements implemented in early phases. This is helpful because near-term budgets and associated funding decisions can be made with confidence that efforts will not require duplication at a later date.

Various aspects of the proposed plan require additional coordination and buy-in from planning boards, transportation departments, elected officials, state mitigation officers, individual property owners, and, potentially, private development groups.

With this understanding, the conceptual plan is provided to assist with continued consensus-building activities across all interested parties to, ultimately, create and implement a unified vision for the 37-acre study area.

EXISTING CONDITIONS

NEED FOR SHORT- AND LONG-TERM SOLUTIONS

HMGP Matthew property acquisitions, including the subsequent demolition of structures on these parcels, have recently been completed. The pending HMGP Florence applications are expected to nearly double the buyout area along the Meadow Branch. This study proposes short- and long-term schemes that simultaneously i) address immediate, on-the-ground land planning concerns from HMGP Matthew, and ii) assess the potential for future economic rebound after the acquisition and consolidation of additional parcels post-HMGP Florence.

ISSUES + OPPORTUNITIES

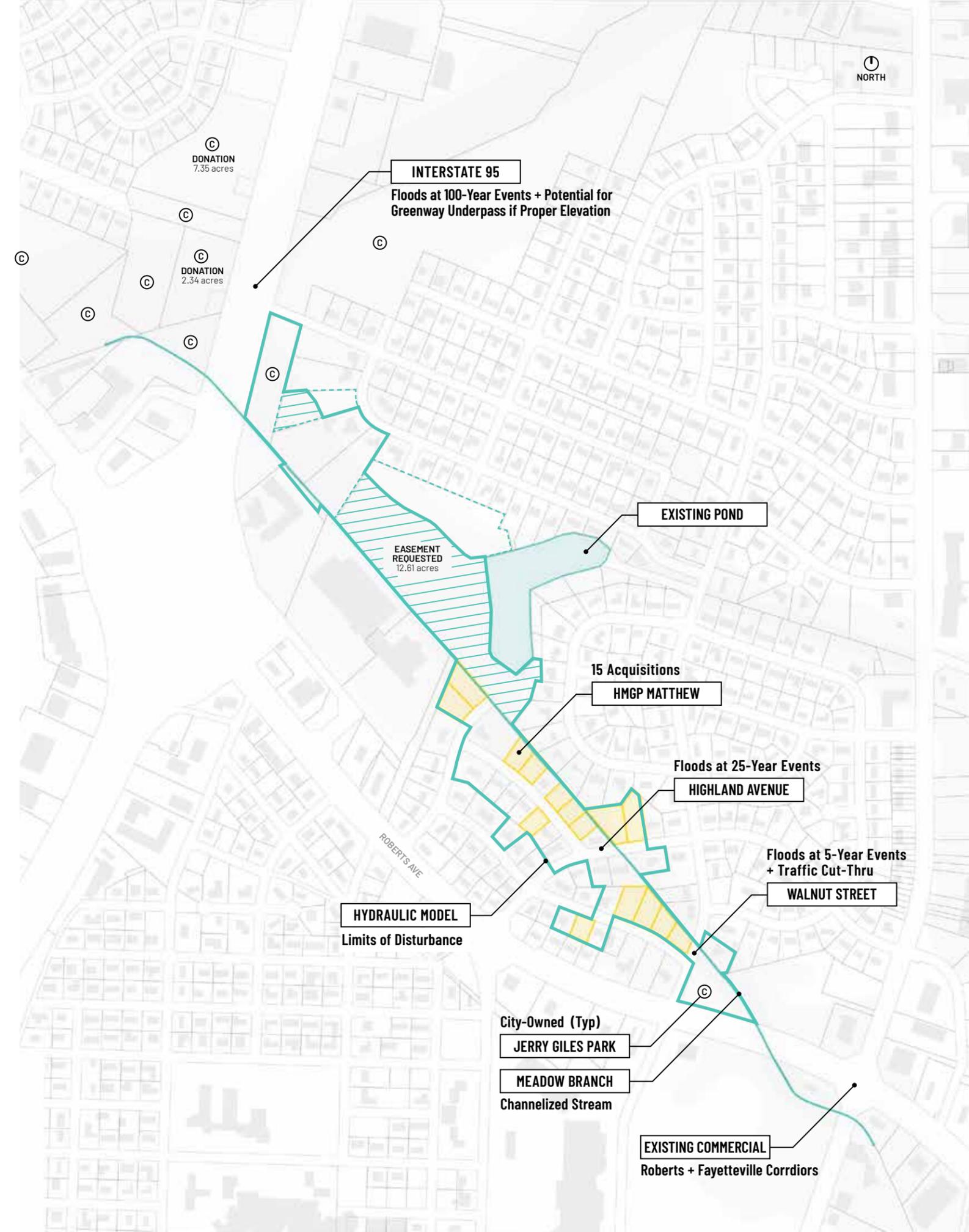
Parcels that have been acquired through HMGP processes must remain in a form of qualified open space for perpetuity. These allowable land uses include: parks for outdoor recreational activities; wetland management; nature reserves; cultivation; grazing; camping (except where adequate warning time is not available to allow evacuation); unimproved, unpaved parking lots; and buffer zones. Additionally, no new structures or improvements can be placed on these properties unless directly designated for functional use as part of the proposed open space use (FEMA Model Deed Restriction, 2019).

While open space along the south side of the Meadow Branch is currently manifest as vacant lots, using these newly acquired parcels to increase publicly accessible greenspace presents a rare opportunity to improve community recreational resources. This can be achieved through the redevelopment of these lands into a public park containing restored segments of the stream channel and associated floodplain. Restoring these hydraulic features

will improve ecosystem functions, including creating habitat and enhancing baseline flood risk mitigation measures.

The proposed planning and design schemes also enable the community to resolve additional, existing land-use conflicts, such as: i) existing single-family residential parcels along the predominantly commercial Roberts Avenue (Hwy 211) corridor; and ii) pedestrian/vehicular safety conflicts, specifically along Walnut Street adjacent to the existing Jerry Giles Park.

When combined, each of the proposed elements contribute to a plan that reduces the ill-effects of flood risk and post-disaster vacancy while simultaneously creating a more cohesive land-use framework for the neighborhood, the City of Lumberton, and Robeson County.



SHORT-TERM SCHEME

AN OPTION FOR REPURPOSING BUYOUTS



Weeks Bayou: Gulf Coast Community Design Studio

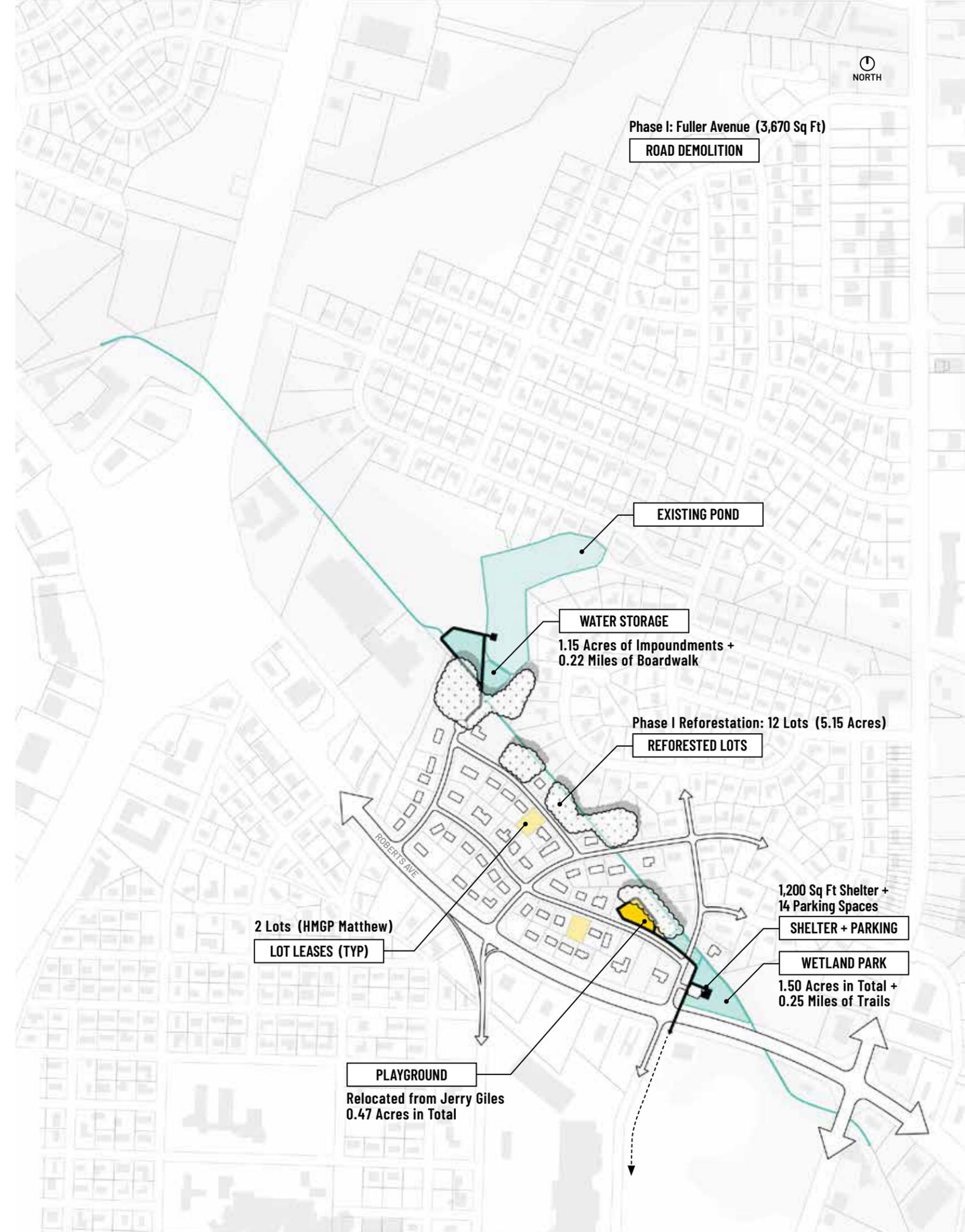
JERRY GILES EXTENSION + INCREASED WATER STORAGE

The primary objective of the short-term scheme is to provide recommendations for repurposing HMGP Matthew acquisitions along the Meadow Branch corridor. These recommendations illustrate ways in which the city can make near-term improvements to vacated lots that will promote a wider range of recreational opportunities, increase water storage, and inform decisions about appropriate types of vegetative cover. If implemented, this short-term scheme fits within the broader recommendations proposed in the long-term scheme without requiring alterations to initial phases of work. In order to realize the short-term scheme, two foundational projects are needed:

1) Extension of Jerry Giles Park. Expand the boundaries of the existing Jerry Giles Park to include the four recently acquired parcels along Elmhurst Drive. This scheme proposes relocating the existing playground at Jerry Giles Park to these newly acquired lots because this area is farther away from the heavy vehicular traffic volumes on Roberts Avenue. Relocating the playground to the west of Walnut Street will also enable the existing Jerry Giles footprint to

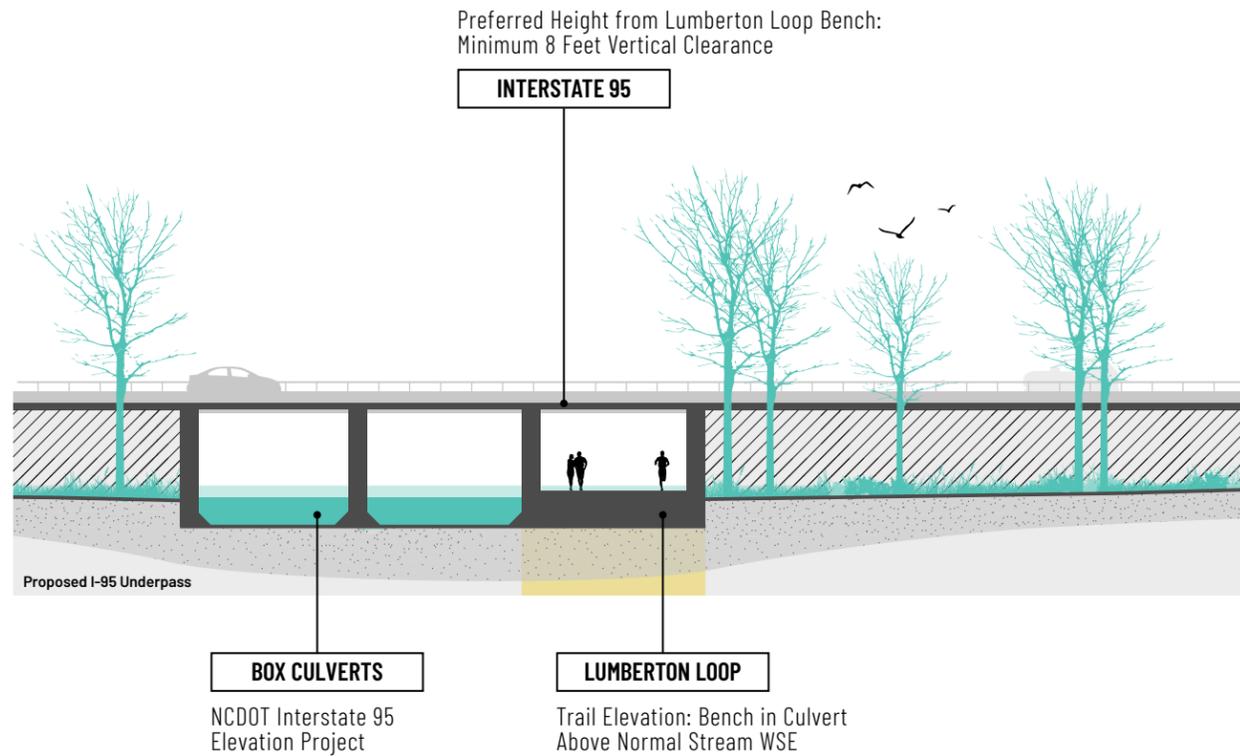
be redesigned into a more ecologically rich condition adjoining the Meadow Branch. This plan proposes converting the existing park footprint into a new wetland parkspace (similar to Weeks Bayou, above) with a sheltered area and a reconfigured parking lot.

2) Increased Water Storage as Part of a Conservation Strategy. Should terms be reached with the identified landowner, a publicly accessible conservation easement can promote recreational opportunities around newly constructed water impoundments.



LONG-TERM SCHEME

AN OPTION FOR RECOVERING LOST TAX BASE



STREAM RESTORATION + LUMBERTON LOOP + REDEVELOPMENT POTENTIAL

The long-term scheme builds on recommendations proposed in the short-term scheme. It does so by expanding Jerry Giles Park to encompass the entire Best Drive corridor, which provides a passageway for the Lumberton Loop. This scheme assumes that all HMGP Matthew acquisitions, HMGP Florence applicants, and the remaining lots located in critical stream restoration locations will all eventually transfer to city ownership. In order to realize the long-term scheme, four foundational projects are needed:

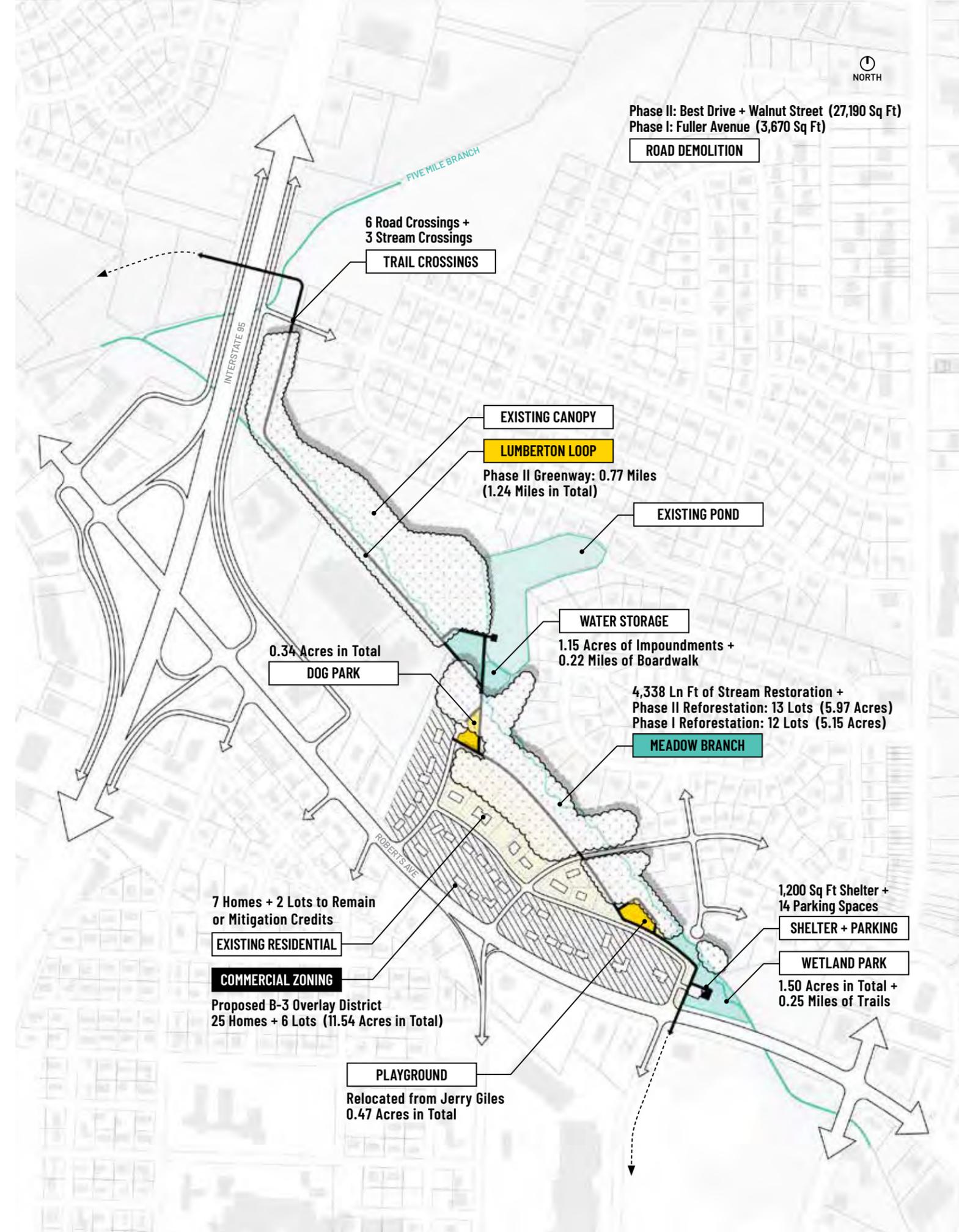
1) Acquisition of Identified Parcels. Several critical parcels will remain under private ownership after current and anticipated neighborhood HMGP buyouts are completed. Acquiring these lots through market-rate transactions will require the city and project partners to either continue to apply for external grants or, if needed, pursue legal actions on abandoned homesites.

2) Demolition of Walnut Street at the Meadow Branch Crossing. This segment of Walnut Street is subject to frequent overtopping due to the

height of floodwaters (inundated in ≥ 5 -year events, as illustrated in the hydraulic analysis). Roads that flood at this frequency pose hazards to both human safety and infrastructure. Because occupied parcels no longer exist along this segment of Walnut Street, it is recommended that this portion of Walnut Street, including utilities, be removed.

3) Meadow Branch Restoration. Stream restoration activities can commence once all the necessary parcels are consolidated in city ownership and the Walnut Street crossing is demolished. As shown, the scope of restoration includes at least 4,300 linear feet of restored stream and approximately 85,000 cubic yards of excavated soil.

4) Rezoning of Identified Parcels. As a way of recovering lost tax base, the parcels between Elmhurst Drive and Roberts Avenue and along Fuller Avenue can be rezoned as part of a commercial overlay district. This rezoning will promote higher density development to better conform with the high traffic volumes on Roberts Avenue. This scheme recommends implementation of a B-3 Overlay District.



LONG-TERM SCHEME

AN OPTION FOR RECOVERING LOST TAX BASE

POTENTIAL REDEVELOPMENT YIELD

This is an analysis of the tax revenue potential of three hypothetical redevelopment alternatives for the proposed rezoned parcels depicted in the Long-Term Scheme. **The purpose of this analysis is to communicate the minimum redevelopment yields needed for Robeson County and the City of Lumberton to recover lost property tax revenues from: i) post-Matthew and post-Florence mitigation programs, and ii) rezoning of select parcels to higher density development along Roberts Avenue.** In all cases the sum of property tax losses from HMGP-related activities includes both approved and pending acquisitions, totalling \$25,605.00 in annual tax losses. Additional annual property tax losses from non-HMGP parcels (acquired through alternative means or via redevelopment) totals \$32,603.00. It is proposed that any new development yields a tax-earning potential equal to or greater than these combined losses, which total \$58,208.00 annually. Using an inverse multiplier for the current property tax rate collected by Robeson County and City of Lumberton (1.42% combined), it is assumed that the total sale price of all redevelopment units must equal \$4,099,154.00 to offset all post-Matthew property tax revenue losses.

Additionally, it is assumed that rezoning the redevelopment parcels to B-3 will support as many as 51 new dwelling units (per dimensional requirements described in the City of Lumberton Code of Ordinances). To offset all post-Matthew property tax revenue losses, the minimum sale price for total redevelopment is divided by the maximum assumed number of dwelling units, which equals an average sale price per unit of \$80,375.00.

The \$80,375.00 per unit sale price for all 51 units is the minimum requirement to fully recover the lost property taxes as a result of the recent floods and subsequent mitigation activities ("B-3 MIN"). However, this analysis calculates two additional alternatives that assume higher unit sale prices to reflect: i) neighborhood average Fair Market Value (FMV) per property ("B-3 AVG"); and ii) active comparable listing prices in Lumberton as of September 2020 ("B-3 COMP"). In these alternatives, the "B-3 AVG" scenario assumes an average per unit sale price of \$122,369.00, while the "B-3 COMP" scenario assumes an average per unit sale price of \$165,550.00.

If each of the three development alternatives resulted in the sale of 51 units, the "B-3 MIN" scenario would generate \$4,099,154.00 in sales,

or \$58,208.00 in annual tax revenues (equal to pre-Matthew annual tax revenue); the "B-3 AVG" scenario would generate \$6,240,819.00 in sales, or \$88,619.00 in annual tax revenues (\$30,411.00 greater than pre-Matthew annual tax revenues); and the "B-3 COMP" scenario would generate \$8,443,050.00 in sales, or \$119,891.00 in annual tax revenues (\$61,683.00 greater than pre-Matthew annual tax revenues).

The fact that all three of these alternatives will, at minimum, offset property tax losses resulting from current and anticipated HMGP activities is the most relevant point to ongoing mitigation practices occurring in this neighborhood. In the case of "B-3 AVG" and "B-3 COMP," the redevelopment of these parcels could yield up to \$87,288.00 more in annual property tax revenue as compared to maintaining conditions as-is.

Further study and careful consideration is needed to assess market demand, average price point for targeted sales groups, and costs associated with outreach, lending, construction, and absorption rates. However, it should be noted that net positive tax yield for Robeson County and the City of Lumberton, as compared to pre-Matthew conditions in this study area, can be achieved through lower density/ lower demand alternatives for both "B-3 AVG" and "B-3 COMP" conditions. **For "B-3 AVG" sale prices, post-Matthew property tax losses are recovered if 34 units are sold; and at "B-3 COMP" sale prices, post-Matthew property tax losses are recovered if 25 units are sold.**

Lastly, per unit sales prices are provided as cost per square foot at various unit sizes in the table provided below:

	1,600 sq ft	2,000 sq ft	2,400 sq ft
B-3 MIN (\$)	50.23	40.18	33.48
B-3 AVG (\$)	76.48	61.18	50.98
B-3 COMP (\$)	103.46	82.77	68.97

While the figures in this table are inclusive of acquisition costs for all rezoned parcels, the lump sum of these costs are estimated by assuming equal values to the 2020 FMV of each property, which totals \$3,272,200.00. Deducting this approximation of acquisition costs from expected sales revenues can inform future assessments that more succinctly determine construction costs (as calculated by either per unit or per square footage).

L

\$58,208

Sum of Annual Property Tax Losses

\$25,605 Sum of Pre-Matthew (2016) Annual Property Taxes of Existing and Expected HMGP Acquisitions + **\$7,160** Sum of Pre-Matthew (2016) Annual Property Taxes of Non-HMGP Supplemental Acquisitions + **\$25,443** Sum of Present-Day (2020) Annual Property Taxes of Rezoned Parcels to be Redeveloped

S

\$4,099,154

Total Redevelopment Sale Price to Equal Tax Losses

$$L \times \left[\frac{1}{0.0077 + 0.0065} \right]$$

Robeson County Property Tax Rate (FY 2019-2020, NCDOR) + City of Lumberton Property Tax Rate (FY 2019-2020, NCDOR)

B3 MIN

\$80,375

Minimum Sale Price / Unit to Equal Tax Losses

$$S \div 51$$

Approx. Unit Yield on Rezoned Parcels with B-3 Dimensional Requirements (CDDL, 2020)

B3 MIN

\$80,375

Approx. Sale Price / Unit to Equal Pre-Matthew Tax Losses

\$4,099,154
Total Sales of All Units
(\$58,208 in Annual Tax Revenues)

B3 AVG

\$122,369

Approx. Sale Price / Unit to Equal Neighborhood Average

\$6,240,819
Total Sales of All Units
(\$88,619 in Annual Tax Revenues)

B3 COMP

\$165,550

Approx. Sale Price / Unit to Equal Comparable Listings Average

\$8,443,050
Total Sales of All Units
(\$119,891 in Annual Tax Revenues)

T

\$25,605 - \$87,288

Range of Added Annual Tax Revenues vs As-Is Condition

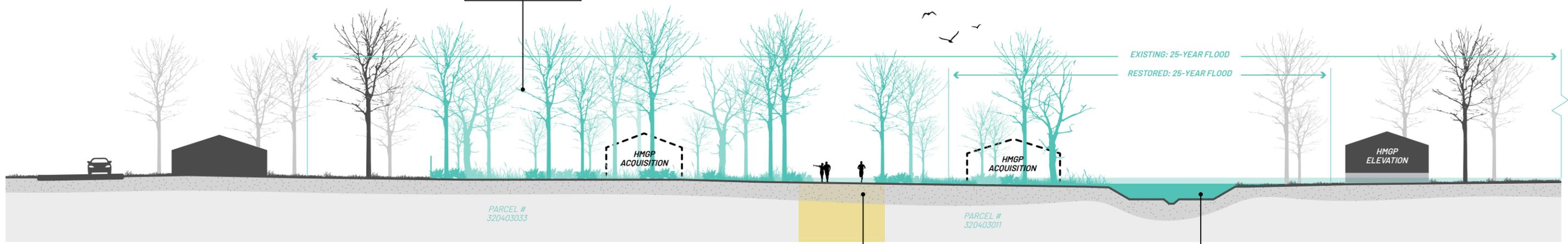
LONG-TERM SCHEME

RESTORATION + RECREATION



Replanting and Rebuilding of the Floodplain

REVEGETATION



LUMBERTON LOOP

Former Road Bed: Best Drive

WIDENED CHANNEL

Meadow Branch Stream Restoration

SCOTTISH PACKING

REIMAGINING A NEIGHBORHOOD LANDMARK

South Lumberton faced the brunt of the floodwaters generated by Hurricanes Matthew and Florence. Situated almost entirely in the floodplain of the Lumber River, heavy rains and elevated river levels pose a continuous threat to the people, homes, properties, and communal assets that reside south of the Lumber.

During Phase 1 of the Lumberton Community Floodprint, the Scottish Packing site was one of the focus areas identified as being critical to the implementation of the Lumberton Loop. The Scottish Packing site has the potential to connect South Lumberton residents to a broader, city-wide greenway system while also providing a parklike amenity that fills a service gap, or deficiency, in available outdoor recreation facilities within its surrounding neighborhoods.

The goals of the Phase 2: Scottish Packing Focus Area efforts include: i) complete architectural assessment and modeling of the existing structures to determine the potential for

retrofitting and repurposing; ii) engage with neighborhood residents to determine preferences for recreational programs and amenities; and iii) develop schematic plans that combine various alternatives for adaptive reuse with community-defined programmatic preferences.

LOCAL LEGACY AND REGIONAL OPPORTUNITY

Scottish Packing was for decades a source of food and employment for South Lumberton residents and the broader community. Over the years the core building grew piece-by-piece to accommodate new operations and uses. Despite its location on the riverside of the earthen levee that wraps South Lumberton, the Scottish Packing facility enjoyed decades of flood-free operation until Hurricane Matthew abruptly halted operations in 2016. Following Matthew, the business owner attempted to repair the property but the damage caused by Hurricane Florence flooding (2018) exceeded the owner's financial capacity to rebuild a second time. The Scottish Packing property presents numerous opportunities to benefit the public. The property's riverine views, direct access to the Lumber, and adjacency to both residential areas and the downtown central business district afford a rare opportunity to create a transformative park, within the context of both its adjacent neighborhoods for everyday use and the region as a part of the larger Lumber River State Park.



Picture. Relics on the Scottish Packing property.



Photo provided by Lee Stevens



THE WRONG SIDE OF THE LEVEE

The Scottish Packing property, located along the banks of the Lumber River just south of downtown Lumberton, suffered significant damage to its facilities during Hurricanes Matthew (2016) and Florence (2018). Situated within the mapped floodway on the riverside of the levee, the Scottish Packing property is constantly vulnerable to elevated water surface levels from the Lumber River after heavy rainfall events.

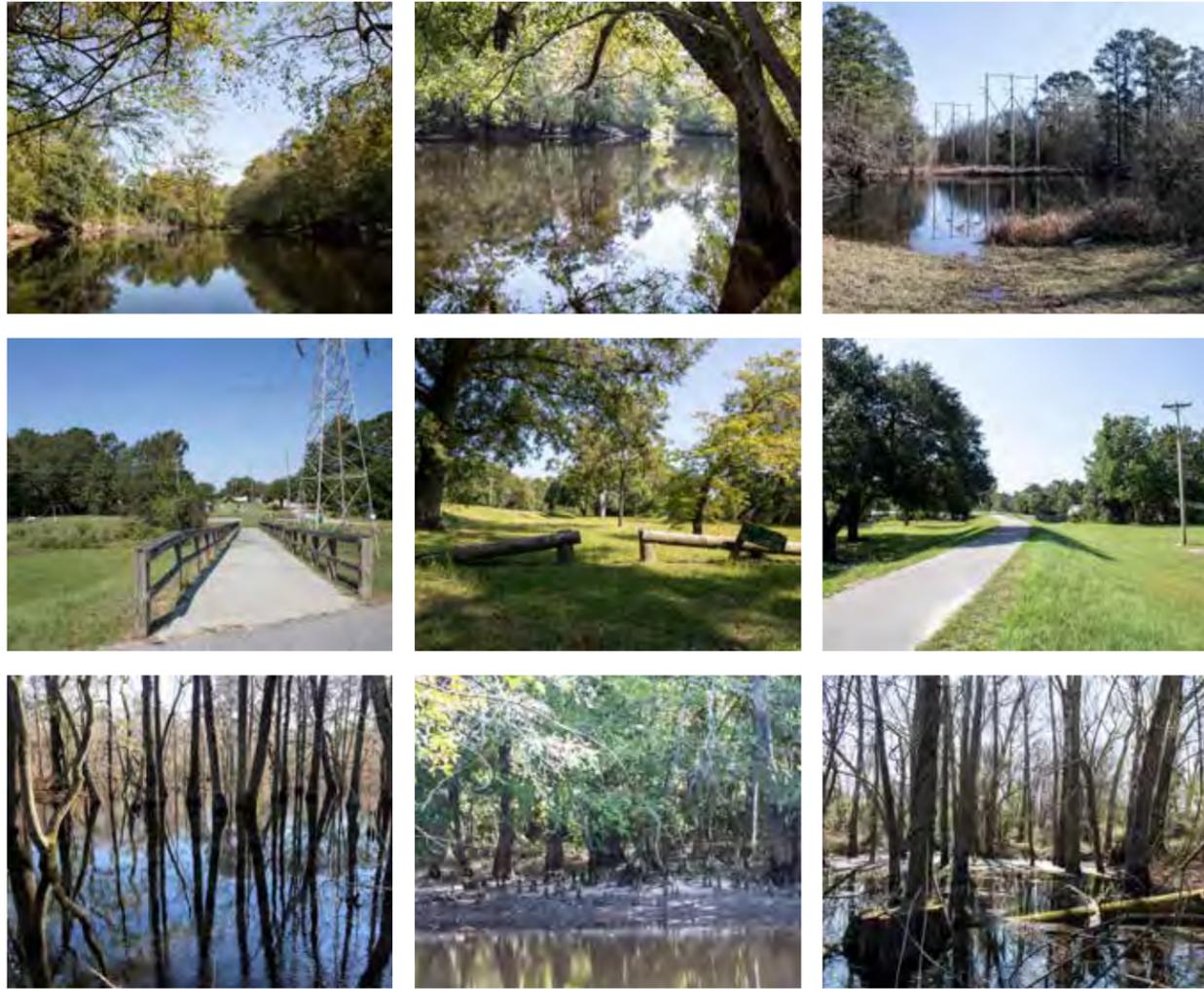
The Scottish Packing property is one of the select properties that require acquisition in order to stitch together the larger vision of conservation, recreation, and flood mitigation as identified within Phase 1 of the Lumberton Community Floodprint. Because the industrial facilities located on the property are no longer operable, the landowner has recently agreed to sell the majority of the property to The Conservation Fund and donate a smaller portion containing the facilities to the City of Lumberton for conversion to an environmental and recreational asset.

As many eastern North Carolina communities grapple with their response to the devastating effects of recent floods, this project will serve as a model for flipping a blighted property into an asset that serves a substantial environmental and public benefit. Projects like this are often referenced in lengthy resilience and recovery plans adopted by counties and local jurisdictions as part of their hazard mitigation response. The successful implementation of this project will serve as an excellent case study of a completed, tangible outcome as connected to these broader planning initiatives. As an example, support for the proposed Scottish Packing project is found in the following:

- i) Robeson County Resilient Redevelopment Plan (ReBuild NC, 2017). Environmental Action: "Expand Recreational Lands and Preserve Floodplain (pp. 4-100).
- ii) Lumberton Recovery Plan (Hurricane Matthew Disaster Recovery and Resilience Initiative, 2018). Recovery Action 15:

"Identify and Condemn Abandoned Properties," Recovery Action 16: "South Lumberton Neighborhood Design and Implementation Plan," and Recovery Action 25: "Create Greenway Program (pp. 95-98)."

In alignment with the needs stated in these planning reports, acquisition and conversion of the Scottish Packing property is an urgent need before further damage occurs or new hazards are encountered. The potential for this property to serve as a community asset is increasingly present and well-supported. The acquisition, demolition, and shoreline stabilization of the property will ensure the protection of the river's sensitive blackwater habitats. Likewise, these actions will simultaneously unlock numerous recreational and educational opportunities for both South Lumberton residents and the broader community who traverse the Lumber River State Park.



BUILDING A NARRATIVE: ECOLOGICAL ASSETS & COMMUNITY CONNECTIVITY

The environmental factors that shuttered the Scottish Packing facilities are the same that make this property an exceptional candidate to become a publicly accessible park. The most unique and significant factors are the property's direct access to and views of the Lumber River.

Successful acquisition of the Scottish Packing property and conversion to a programmed park space will: i) secure the long-term protection of the riverine property; ii) remove impervious surfaces and potentially hazardous materials from the Lumber River floodway; iii) allow for environmental enhancement and restoration activities to commence; and iv) stabilize a portion of the shoreline to ensure safe, reliable public access to the river.

Although the proposed project is most directly geared toward the enjoyment of South Lumberton residents, the project's regional impact cannot be underestimated. The property's size, frontage along the Lumber River, and existing connectivity to downtown via

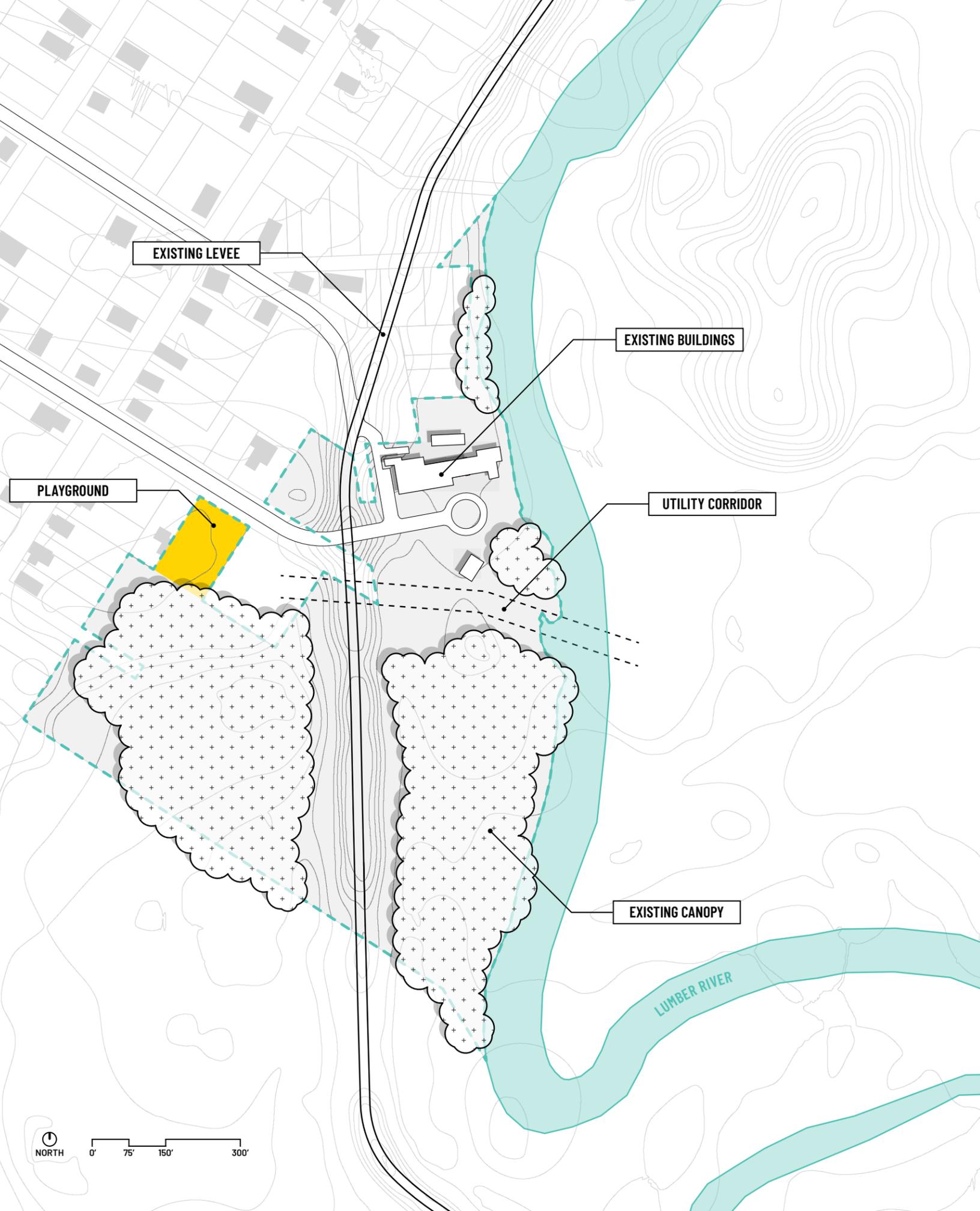
an elevated greenway collectively position it as the primary in-town destination for the City of Lumberton within the entire 115-mile long Lumber River State Park system. As a designated Natural & Scenic River, the Lumber River and associated state park is commonly traversed by boating, fishing, and wildlife enthusiasts.

The property's existing structures represent significant environmental impacts. Most notable among these is the amount of impervious surface that drains stormwater directly into the river. Additionally, the facility's current state of disrepair, including the industrial equipment contained in and around the site, present a condition where potentially hazardous contaminants may enter the riverine system during future flood events. Potential funding and financial awards for the proposed project will enable the demolition and removal of approximately 8,500 square feet of impervious surfaces and mitigate the risk of contaminants leaching into the ground or entering the river. The following activities must occur for successful implementation of the project: i) an executed

sales transaction with the property owner; ii) secured permits and approvals for required abatement activities; iii) demolition and disposal of unused and non-viable portions of the facilities; iv) issuance of a RFP/RFQ for design and construction activities; v) secured permits and approvals for boat ramp construction, shoreline stabilization, and building renovations; vi) construction and installation of proposed park features; vii) post-construction evaluation to ensure satisfactory completion of all phases of work; viii) completion of a management/maintenance plan; and ix) completion and submission of all reporting that may be required if external grants are awarded.

SCOPE OF WORK

EXISTING CONDITIONS + OUTCOMES TO DATE



HMGP + BRIC LOI SUBMITTED
Funds Requested to Support Acquisition + Green Infrastructure



NC PARKS ADVOCACY
Request for Inclusion in Lumber River State Park Master Plan



EEG GRANT SUBMITTED
\$325,100 Pending EEG Application with the CDDL + the City + The Conservation Fund



CWMTF GRANT SUBMITTED
\$215,830 Pending CWMTF Application with The Conservation Fund + the City



DUKE ENERGY GRANT SUBMITTED
\$50,000 Pending Duke Energy Application with The Conservation Fund + the City



PURCHASE OFFER SUBMITTED
Purchase / Donation Offer with The Conservation Fund + the City Pending Funds

BUILDING CONSENSUS AND MOMENTUM

At the time of this reporting (October 2020), a purchase offer from The Conservation Fund had been accepted by the Scottish Packing landowner. This agreement sets the terms for both the purchase for the 10.5-acre (+/-) property (pending the availability of requested grant funds) and the donation of the remaining 1.26-acre (+/-) parcel and all structures to the City of Lumberton. This purchase agreement is a significant outcome of all Floodprint efforts to date. During Phase 2, the project team conducted the following activities to facilitate continued discussions related to the community's long-term vision for the Scottish Packing property:

- + **Community Engagement.** Used to collect an inventory of user preferences within the focus area;
- + **Architectural Modeling.** Used to determine adaptive reuse potential of the existing structures;
- + **Schematic Design.** Used to build consensus around a unified plan, programs, and strategic actions for creating a neighborhood amenity and regional destination.

The processes undertaken in the Phase 2 Floodprint scope of work have either directly led to or assisted with several important outcomes to date, including: submission of an HMGP Letter of Interest (co-written by the CDDL and the City); written requests for inclusion in the Lumber River State Park Master Plan (submitted by the CDDL, the City, and The Conservation Fund); submission of a \$325,100.00 North Carolina Environmental Enhancement Grant (EEG) application (led by the CDDL); submission of a Clean Water Management Trust Fund grant application (led by The Conservation Fund); and, most recently, the previously described purchase and donation agreements.

COMMUNITY OUTREACH

SCOTTISH PACKING

Community engagement can play a critical role in strengthening social cohesion by creating opportunities for citizens to gain awareness of opportunities and threats, participate in resiliency efforts, and increase their community networks through participation in shared activities. Engagement activities for the Scottish Packing focus area focused on building resident awareness of flood risks and enabling the project team to better understand neighborhood desires related to future public green spaces.

RESIDENT ENGAGEMENT

The project team worked closely with city staff to create engagement plans and develop public meeting communication materials. Engagement activities were also coordinated with council members and community leaders from the two precincts (Precinct 5 and Precinct 6) that represent the areas surrounding the Scottish Packing project boundaries. The Deputy City Manager and City Attorney reviewed workshop materials and attended meetings to express their support and answer questions pertaining to the city.

The project team engaged twice with neighborhood residents living near the Scottish Packing site and once with the City Council, including:

Meeting #1 (October 1, 2019): Initial listening session with residents, area stakeholders, agency partners, and representatives from the project team. The community meeting included city staff who presented findings from past projects and introduced the current project. Activities focused on listening to resident needs, wants,

issues, and opportunities related to current recovery processes as well as creation of future green spaces.

Meeting #2 (December 10, 2019): Presentation of three (3) Scottish Packing site design and adaptive reuse alternatives. Multiple design alternatives were presented and discussed to build consensus around and a preferred schematic design alternative.

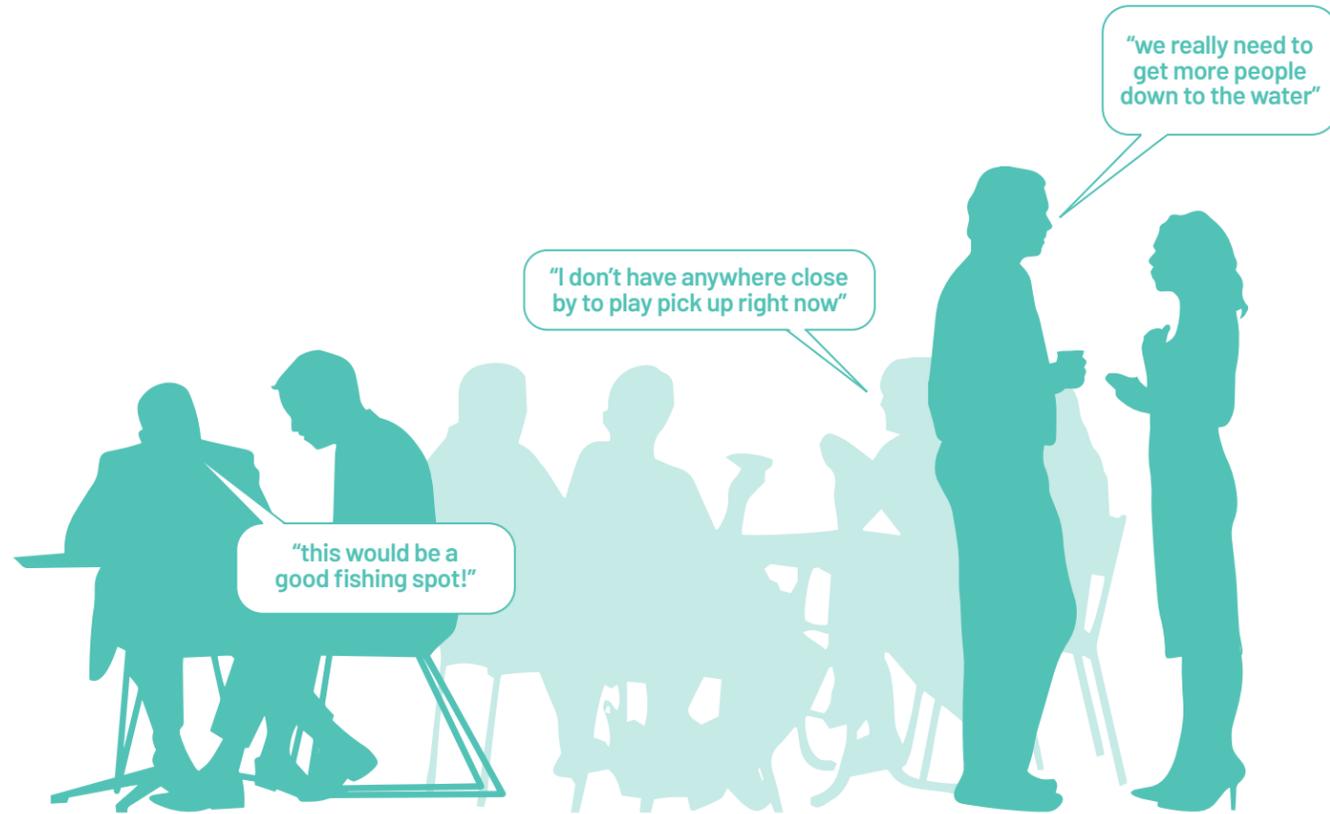
Meeting #3 (August 5, 2020): The project team's plan for a third community meeting was suspended due to the onset of the COVID-19 pandemic and associated, state-mandated orders restricting public gatherings. The final planning recommendations and design alternatives produced as a result of the first two community meetings were, however, presented (via videoconference) to Lumberton City Council and staff. The preferred design alternative and other recommendations contained within this report were finalized based on the positive feedback received from council members and staff.



Picture. Scottish Packing Workshop #1.

MEETING ONE

LISTENING SESSION



GOALS, STRUCTURE & RESULTS

The activities conducted in the first community meeting focused on listening to residents. The objective was to gain an understanding of neighborhood needs, wants, issues, and opportunities related to the adaptive reuse of the Scottish Packing site, including the creation of future programs and management of its landscape.

This meeting was structured to facilitate conversations between neighborhood residents, area stakeholders, and the project team. Workshop materials focused on the topics of community life, existing challenges, and future desires. The project team guided and documented these conversations through small group break-out sessions. By the end of the workshop, all community participants had voiced their opinions on the aforementioned topics as they relate to the neighborhood's changing landscape.

During the workshop, concern was consistently expressed pertaining to: i) the current lack of passive and active recreational

facilities serving South Lumberton; and ii) the need for any proposals related to the reuse of the Scottish Packing property to consider the "hidden aspects" that change might bring (i.e., safety concerns, proper lighting, impact on surrounding homes, etc.). There was, however, significant interest in the creation of a new park amenity that offers indoor/outdoor space for programmed recreational activities, accommodates family reunions and community gatherings, and serves as an educational hub for the Lumber River.



TOPIC: COMMUNITY LIFE

Question: "What are aspects of the Scottish Packing property and surrounding neighborhoods, both past and present, which could be recognized or celebrated?"

Most Common Responses:

- + Scottish Packing as a Landmark
 - "Missed but not Forgotten"
- + Identity / Theme:
 - Lumber River and Community History
 - Educational Resource



TOPIC: EXISTING CHALLENGES

Question: What spaces for community gathering currently exist in your neighborhood? What challenges exist that might prohibit Scottish Packing property from becoming a successful community space?

Most Common Responses:

- + Need to Develop an Approach to "Hidden Aspects:"
 - General Safety Concerns
 - Proper Lighting
 - "Eyes on the Street"
 - Impact to Nearby Homes



TOPIC: FUTURE DESIRES

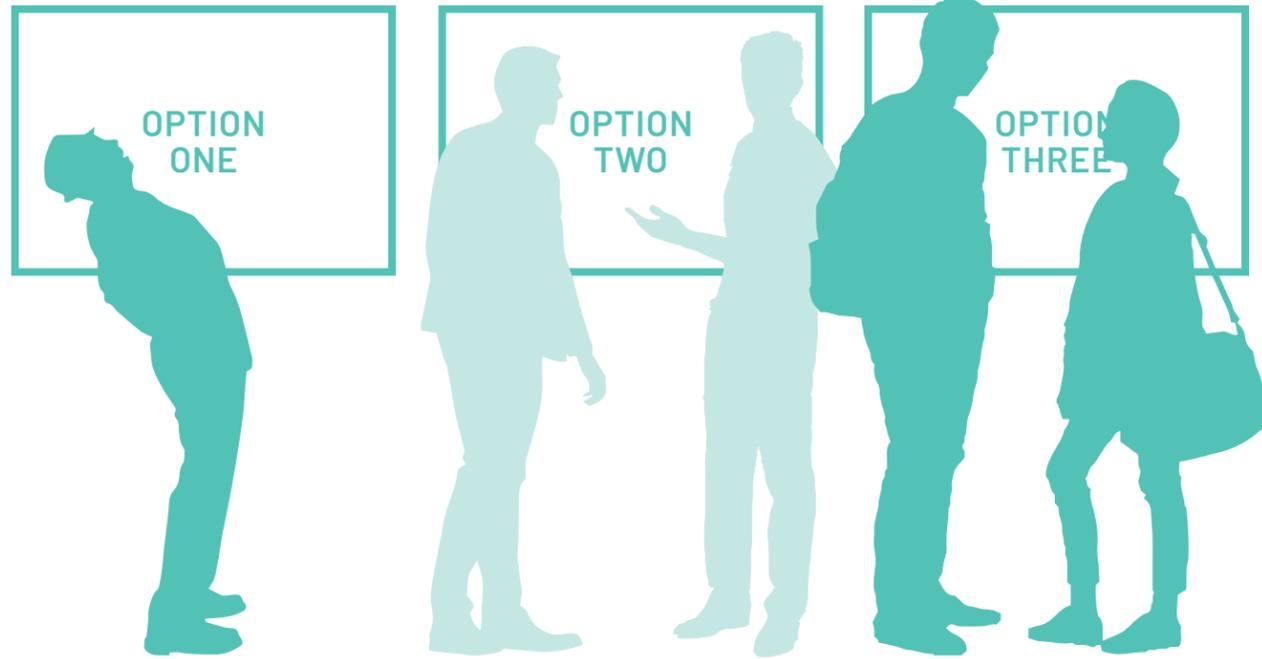
Question: What does 'community space' mean to you? How might a future community space engage with aspects of your daily life?

Most Common Responses:

- + Indoor / Outdoor Flexibility
- + Family Reunions + Spaces for All Ages
- + Sport Fields / Courts
- + Gated Dog Park Area
- + Fishing Piers
- + Restrooms
- + Kiosks / Information Booths

MEETING TWO

DESIGN ALTERNATIVES WORKSHOP



GOALS, STRUCTURE & RESULTS

The second community meeting shared with neighborhood residents three (3) schematic design alternatives that: i) responded to issues and opportunities expressed during the first listening session; and ii) generated participant feedback via voting on a preferred alternative. Resident voting served as a method of building consensus around a preferred schematic design alternative.

Of the three alternatives presented, there was a clear majority preference for the proposal titled: "Educational Focus." This plan called for a complete reconfiguration of the Scottish Packing building and for programming that aligns most closely with environmental educational opportunities.

Preference was measured by tallying votes and through anecdotal conversations with participants during the workshop. The selected plan was preferred due to the: i) passive recreational amenities it provided (as opposed to active recreation alternatives that were

perceived as too noisy); ii) direct programmatic connection to and focus on the Lumber River; and iii) the precedent examples of educational resource centers, birding look-outs, and fishing pavilions aligned with participants' aesthetic preferences and desired uses.



OPTION ONE: EDUCATIONAL FOCUS

65%



OPTION TWO: SOCIAL FOCUS

22%

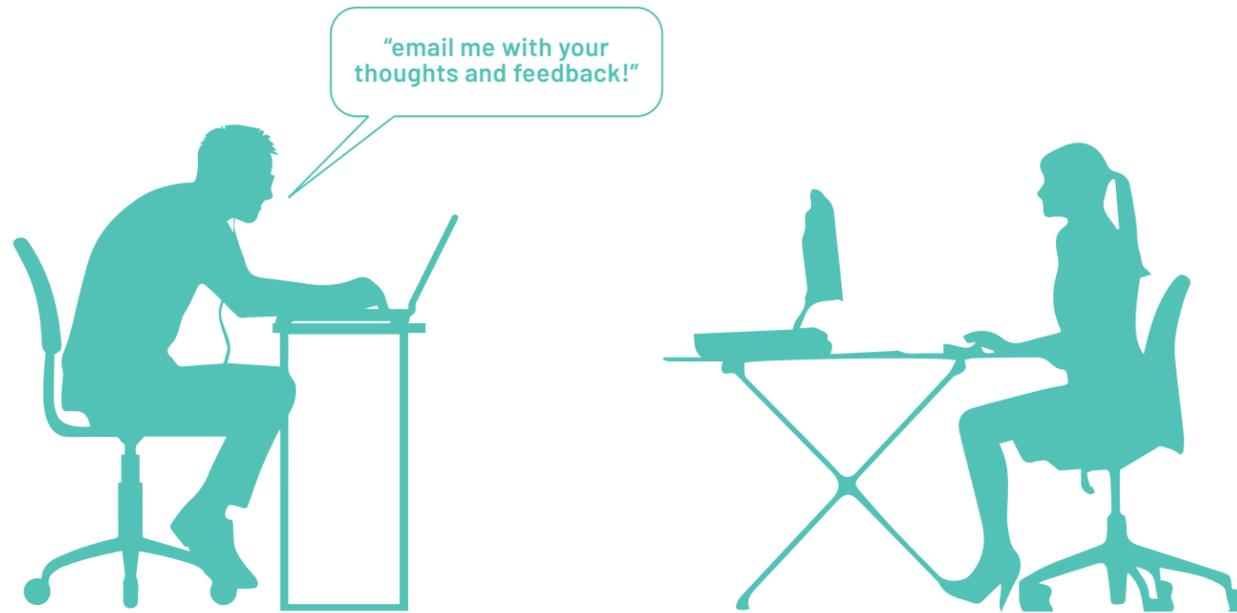


OPTION THREE: RECREATIONAL FOCUS

13%

MEETING THREE

PRESENTATION TO CITY COUNCIL



GOALS, STRUCTURE & RESULTS

The purpose of the third meeting was to present research findings, planning recommendations, and the preferred schematic design. Due to COVID-19 restrictions on physical gatherings, this was conducted via an online, digital presentation as part of a Lumberton City Council public meeting.

During this meeting, the project team also updated elected officials on the status of additional, associated project outcomes, either completed or pending. The following is an excerpt from the published City of Lumberton meeting minutes:

“Deputy City Manager Brandon Love introduced Andrew Fox and Travis Klondike from NC State University Coastal Dynamics Design Lab to the Council. Mr. Fox and Klondike gave a brief presentation on the work that they have done thus far as it pertains to the design proposals for repurposing the existing and the expected buyout parcels along Meadow Branch and Best Drive. They talked about the Interest Meetings that they had with the citizens and

what interest that showed in the revamping of Scottish Packing property in South Lumberton and the most popular turned out to be an Educational Focus.

They stated that this project is fully funded through the NC Community Foundation at no cost to the City. They also thanked Brandon, Wayne, Holt and Brian Nolley along with Councilmen Cantey, Howard, and Rising and Councilwoman Robinson for their assistance with the plan.

Deputy City Manager Love thanked Mr. Fox and Klondike for wanting to come in and offer their help. He stated that several others have come and offered assistance; however, NCSU by far has done more than any other group, even identifying funding.”

SELECT PRESENTATION SLIDES





CONCEPTUAL DESIGN

PURPOSE + INTENT

The final schematic design alternative was created by combining community-defined preferences for land planning and recreational amenities with architectural models for adaptive reuse of the Scottish Packing structures. This proposal is intended to be used as a blueprint for the city and its partners to initiate reconstruction activities on the property as funding and external grants become available. Material quantities of various architectural features have also been provided to assist with itemizing various phases of work.

CONSOLIDATING RECOMMENDATIONS

The Scottish Packing community workshops provided valuable insights into resident preferences and informed a clear programmatic direction for creating site design and adaptive reuse schemes.

Room-by-room assessments of the existing, as-is Scottish Packing buildings and structures determined that most of the main building needs to be removed prior to allowing public access onto the site. The interior, brick core of the original building has the most structurally-sound wall conditions and the highest ceilings. Preserving this original portion of the building while other portions are demolished and hauled is recommended.

The project team used resident feedback to inform the proposals for repurposing and enhancing both the original building core and the site. Because resident preferences were overwhelmingly in favor of an educationally focused program, the schematic designs reflect multiple ways to capture the ecological and social

benefits a reimagined Scottish Packing property can provide to the community.

The information provided as part of this schematic design package is conceptual and used largely for consensus-building and fundraising purposes. The project team has assisted with and/or led grant applications to initiate this effort, however additional coordination and collaboration with architects and engineers is needed to facilitate the full buildout of the proposed features.

ADAPTIVE RE-USE

DECONSTRUCTION + RECONSTRUCTION

Total Area of (2) Existing Buildings: **3,700 sf +/-**

DEMOLITION #1 AUXILIARY BUILDINGS

Total Area: **2,733 sf**
 Exterior Walls (CMU + Concrete): **1,213 sf**
 Exterior Walls (CMU + Brick): **1,689 sf**
 Interior Partitions (Wood Stud): **461 sf**
 Wood Board Ceiling: **2,459 sf**
 Roof: **2,733 sf**

DEMOLITION #4

Interior Partitions: **1,236 sf**
 Drop Ceiling: **2,432 sf**
 Roof: **2,817 sf**

DEMOLITION #5

SHELL TO REMAIN

DEMOLITION #3

Total Area: **2,735 sf**
 Exterior Walls (CMU + Wood Stud): **1,559 sf**
 Interior Partitions (Wood Stud): **2,350 sf**
 Drop Ceiling: **2,436 sf**
 Roof: **2,735 sf**

DEMOLITION #2

Metal Freezer: **621 sf**
 Corrugated Metal Canopy: **2,036 sf**

Wooden Truss + Skylight: **4,403 sf**

NEW ROOF

Wooden Truss: **630 sf**
ROOF EXTENSION

Wood Decking: **4,628 sf**
FISHING PIER

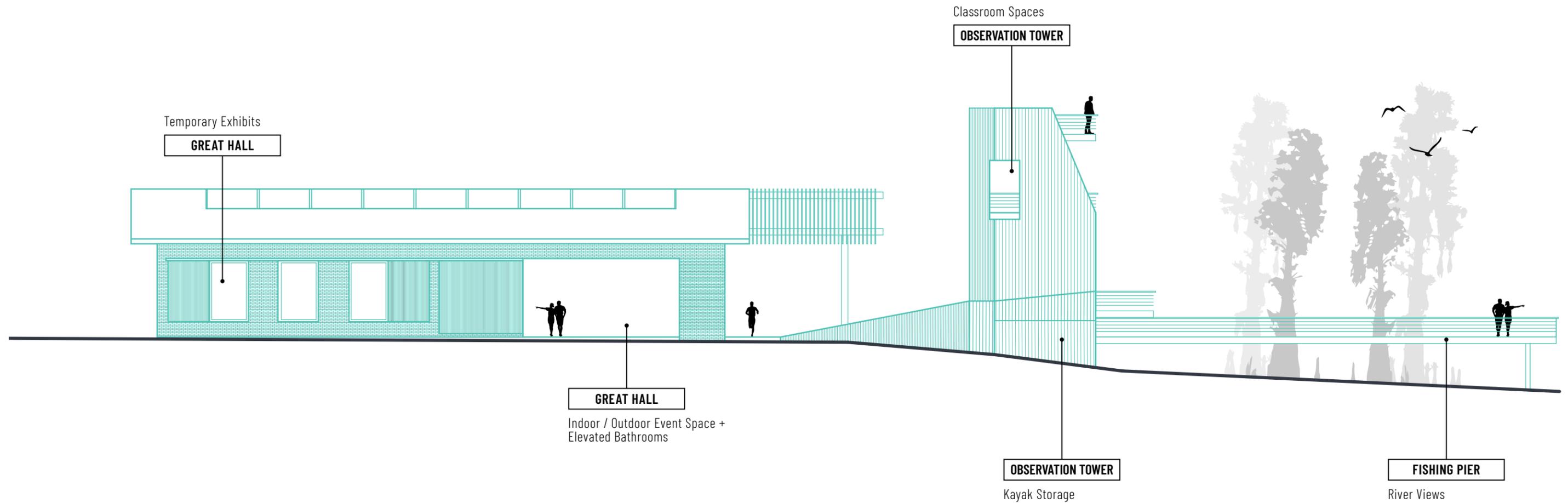
Stairs + Ramp: **274 sf**
WASHROOM ACCESS

GREAT HALL

Bathrooms: **260 sf**
 Raised Floor: **105 sf**
 New Openings (Brick Masonry): **1,165 sf**

OBSERVATION TOWER

Wood Construction: **1,300 sf +/-**



PROPOSED CROSS SECTION

The following calculations were generated from site measurements conducted by the research team and architectural drawings provided by the property owner. The area totals are estimates only; they are approximations intended to inform grant applications. Additional structural analysis and material take-offs are required to inform final hauling volumes and/or demolition bids.

Estimated demolition quantities include:

- + 9,168 sf: Total Area of Buildings Demolished
- + 1,123 sf: Exterior Walls (CMU + Concrete)
- + 1,559 sf: Exterior Walls (CMU + Wood Stud)
- + 1,689 sf: Exterior Walls (CMU + Brick)
- + 2,350 sf: Interior Partitions (Wood Stud)
- + 1,236 sf: Interior Partitions (Other)
- + 2,436 sf: Drop Ceiling
- + 2,735 sf: Wood Board Ceiling
- + 2,735 sf: Roof

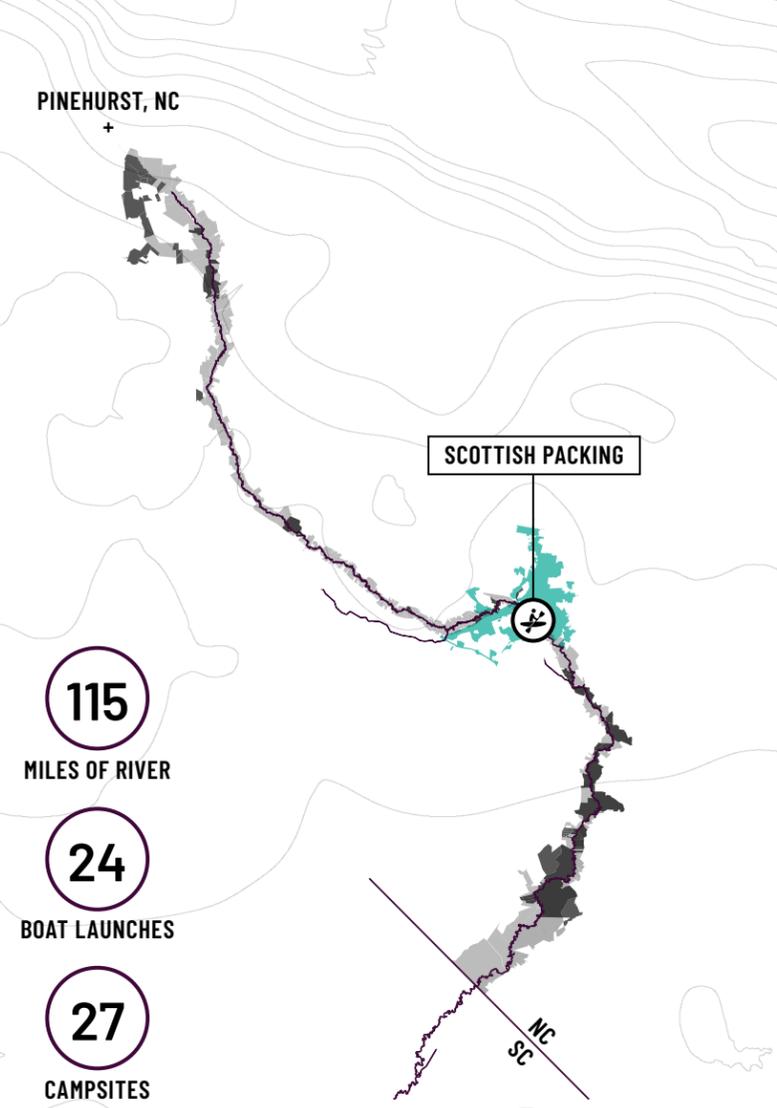
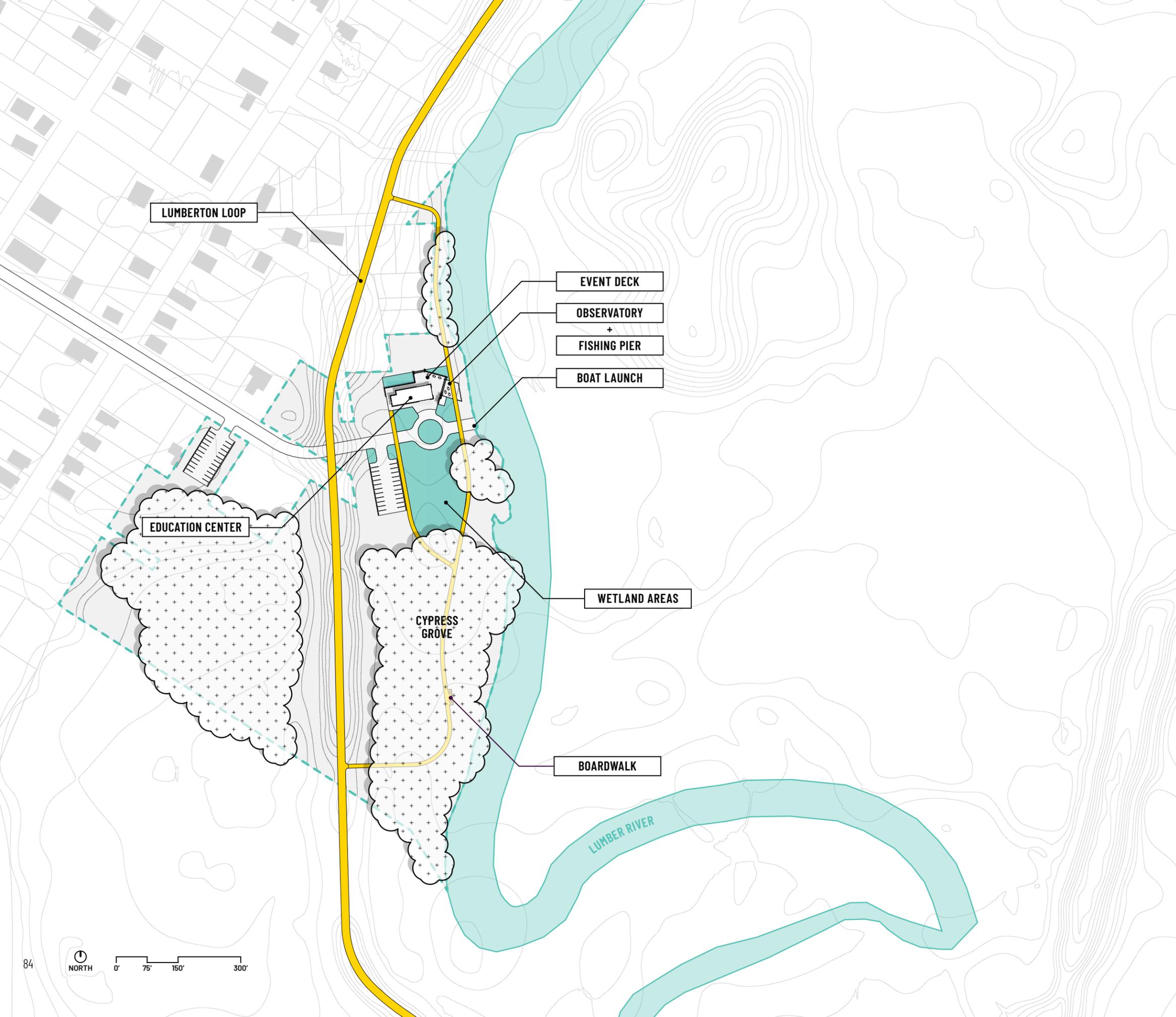
- + 2,036 sf: Corrugated Metal Canopy
- + 621 sf: Metal Freezer

These figures do not include machinery or objects within the buildings that must be removed.

In addition to considering the raw materials to be deconstructed, all demolition cost estimates should include tipping fees. Tipping fees are required for landfilling debris. These fees are estimated by calculating the tonnage associated with hauling demolition debris. The 2020 Robeson County Landfill fee schedule includes \$29.50 per ton of Construction and Demolition (C&D) material and \$2.00 per ton administered as a NC State Disposal Tax (which may or may not be applicable depending on the ownership status of the property).

As part of the hauling costs, all demolition cost estimates should account for a 35-mile round trip per truckload to

the Robeson County Landfill. A reimbursement rate of 57.5 cents per mile is recommended (IRS, 2020). Lastly, it is recommended to a budget a minimum of \$34,000.00 as contingency for potential asbestos abatement.



SITE PLAN + LUMBER RIVER STATE PARK

In 1989, 81 miles of the Lumber River stretching from the South Carolina Border to the Sandhills Game Land in Scotland County was added to the North Carolina Natural and Scenic River System, forming Lumber River State Park. Additionally, the Lumber River was designated a National Wild and Scenic River in 1998 and is one of only two in the state of North Carolina. These designations carry with them special protections and access to funding which supports the management of the Lumber River State Park and ongoing land acquisitions.

The Scottish Packing property, given its location on the banks of the Lumber River, provides to users of the Lumber River blueway the nearest point of water access to the heart of downtown Lumberton. Furthermore, the revamped Scottish Packing property, as proposed, will convert the blighted site into one that benefits the residents of South Lumberton on a daily basis through active and passive recreational, educational, and social amenities.



OBSERVATORY



EDUCATION CENTER



LUMBERTON LOOP

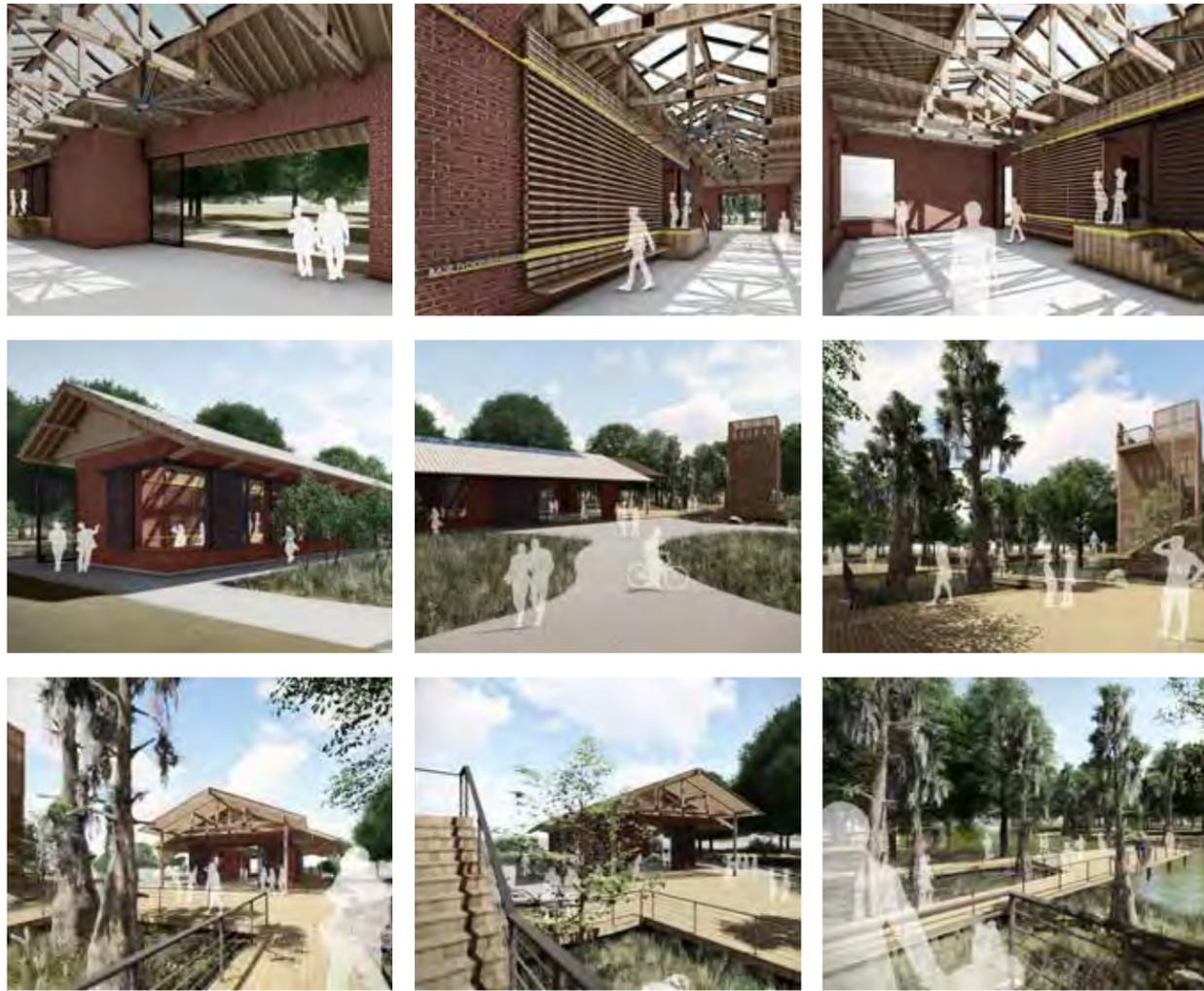


BLUEWAY: LRSP



FISHING PIER





PROPOSED FEATURES

The proposed renovation of the Scottish Packing site includes extensive construction activities to the landscape and the remaining building shell.

As shown, all of the auxiliary building additions encompassing the original brick core are removed. The brick core is the most structurally sound and has the tallest ceilings, therefore it is repurposed as an open, flexible space capable of hosting large gatherings and exhibiting educational displays. As articulated by neighborhood residents during the community meetings, careful attention has been given to publicly accessible bathrooms, adequate site lighting, and general user safety.

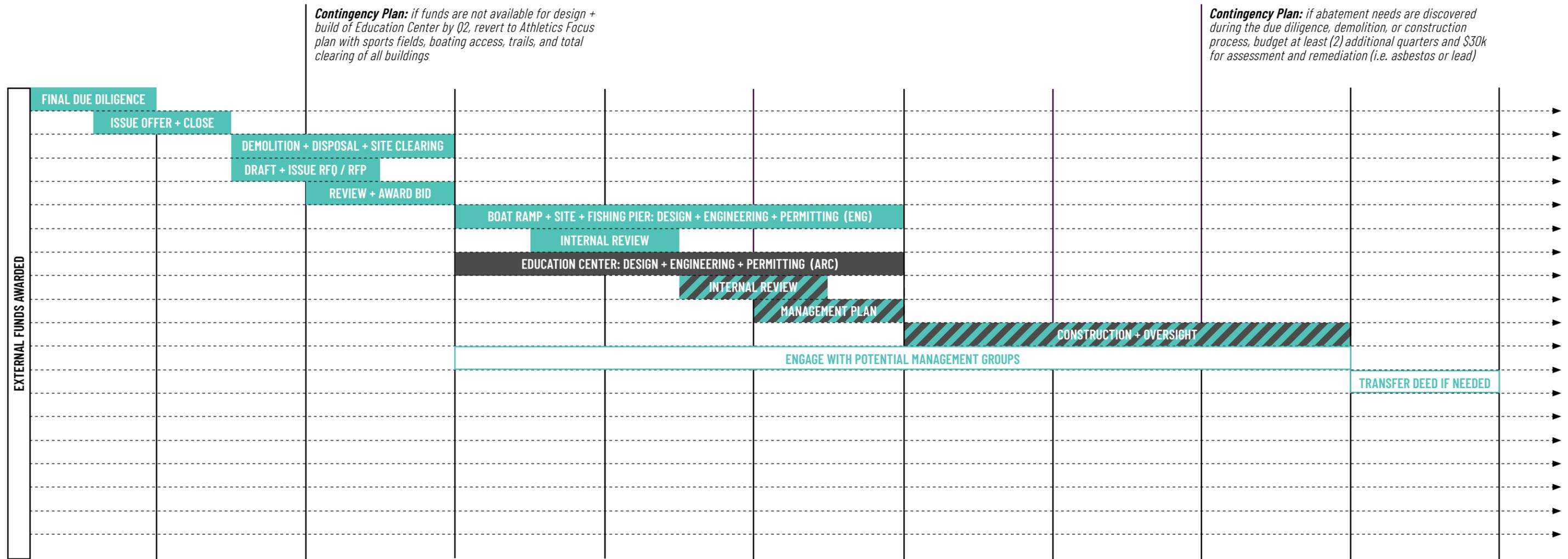
A bathroom is provided within the interior of the building. It is raised above the base flood elevation (BFE) of the river and is accessible by both interior stairs and an exterior ramp. Locking the bathrooms after park hours is recommended. Natural lighting is provided within interior spaces by replacing portions of the roof

apex with glass panels, as seen through the wooden rafters in the above illustrations. Installing fans along the rafters to provide air circulation is recommended. Lastly, all points of building egress include sliding, perforated doors. These doors can be opened during operating hours and easily closed and locked outside of posted park hours.

Separate from the former Scottish Packing building are several proposed site improvements that maximize the property's use as a recreational and educational resource. These ancillary amenities include an elevated river observation platform, a boat ramp, a fishing dock, and a network of interpretive, multi-modal trails.

The cost to demolish portions of the Scottish Packing building and install a boat ramp has been requested as a part of a North Carolina Environmental Enhancement Grant (EEG) Grant application. It is recommended that subsequent phases of installation focus first on installation of parking areas, walking

trails, and boardwalks. Upon completion of these initial passive recreation amenities, larger sums of funding can be pursued to retrofit the building.



PROPOSED TIMELINE

Anticipated project activities are outlined below in a quarterly format to provide benchmarks for the project team. These tracking milestones align with the reporting requirements of many grant programs.

In order to meet these benchmarks, the City of Lumberton will need to be responsible for the oversight and completion of all proposed phases of work. However, in-kind commitments of time from project partners are planned as a part of completing this project. Most notably, The Conservation Fund is assisting with transactional matters involved with securing the deed to the property for the city (The Conservation Fund funded and received a certified appraisal of the property, and recently entered into a purchase agreement with the property owner). In addition to its past and ongoing technical assistance efforts, the NCSU Coastal Dynamics Design Lab can assist in the creation or oversight of: review of demolition, construction, and/or management plan documentation; design review; and post-construction evaluation activities. Permitting

and approvals for any abatement (if needed), demolition, and construction activities will either be completed by City of Lumberton staff or a third-party contractor.

Project Quarter: One

- Complete final due diligence activities for the property (survey, legal description, and environmental assessments)
- Draft and issue purchase offer to property owner
- Execute property purchase with agreed upon close date not to exceed (30) days
- If needed after completion of due diligence, issue call for environmental abatement contract to third party

Project Quarter: Two

- If needed, third party contractor to complete environmental abatement activities
- City of Lumberton staff to commence with demolition and disposal activities

- Draft and issue RFP/RFQ for boat ramp/shoreline stabilization design and build

Project Quarter: Three

- Completion of all demolition and disposal activities
- Review RFP/RFQ applicants and award contract

Project Quarter: Four

- Issue third-party contract to begin design, engineering, and permitting activities for boat ramp/shoreline stabilization

Project Quarter: Five

- Third party to continue design, engineering, and permitting for boat ramp/shoreline stabilization activities and submit construction timeline for approval to project team (not to exceed three quarters to complete)
- Formal project team design review period for proposed design schema

Project Quarter: Six

- Third party to complete design, engineering, and permitting activities
- Completion of management and maintenance plan

Project Quarter: Seven

- Third party to begin construction activities
- Project team to monitor construction activities

Project Quarter: Eight

- Third party to complete construction activities
- Project team to monitor construction activities
- Project team to complete post-construction evaluation

RESOURCES

CITATIONS + REFERENCES

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