Wilson, North Carolina

HOMINY CREEK GREENWAY *and* WATER QUALITY PARK

MASTER PLAN

ACKNOWLEDGEMENTS

Thanks to the local residents, business leaders, community leaders, and government staff who participated in the development of this project through meetings, events, volunteering, interviews, and review.

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Section 1

PROJECT BACKGROUND

CONTEXT

The City of Wilson has identified a stream corridor named Hominy Swamp Creek that includes opportunities for recreation, education, stormwater quality improvement, and flood control. Like many other American cities, the City of Wilson suffers from health ailments related to lack of exercise and active transportation. A greenway will be the first facility in Wilson County that citizens can access safely from a neighborhood. Opportunities exist along Hominy Creek to reduce flooding and improve water quality using best management practices, while also rehabilitating wildlife habitat. The Hominy Creek Greenway and Water Quality Park Master Plan identifies a preferred alignment and concept for creating a recreational facility in tandem with flood control solutions. This document summarizes existing conditions, opportunities and constraints for such a project.

HISTORY AND SETTING OF WILSON

The City of Wilson is a small historic city in the coastal plain of North Carolina. It is the county seat located in Wilson County. Wilson is easily recognized for its outstanding quality of life, southern charm, historical importance, welcoming community, and its desire to progressively plan for the future.

The City of Wilson has a population approaching 50,000 people, and is clearly the economic, social, educational, governmental, and cultural center of Wilson County. It is a regional economic center for agriculture, manufacturing, commercial, and service businesses jobs, services, and retail trade.

Hominy Swamp Creek is a prominent feature in Wilson's landscape, roughly bisecting the city north to south. Roads cross the creek 10 times in the project area, representing a substantial historic capital investment. The waters of Hominy Swamp Creek were once used to power grist mills, and as Wilson grew and development increased, the topography of the stream basin lent itself to use as a major stormwater drainageway. Continued development resulted in occasional flooding and the degradation of the natural resources of the stream corridor.

The project corridor will connect to historic downtown Wilson.

A major step in the rehabilitation of the stream occurred in 1999, when the Wetland Restoration Program of the North Carolina Division of Water Quality used an Environmental Protection Agency grant to fund a stream restoration project on approximately 2,230 feet of channel adjacent to the Recreation Center facility, between the Kincaid Avenue and Raleigh Road crossings.

The community has much heritage and history, with significant ongoing preservation, utilization, and celebration including festivals, outdoor concerts, historic walking tours, porch tours and events. Wilson is also home of the internationally known folk artist Vollis Simpson and his elaborate Whirligigs. The Hominy Creek Greenway and Water Quality Park corridor will extend from Williams Dazy Camp and connect to Ridgewood Park, totaling approximately 3.8 miles. This Master Plan was based on previous stream restoration work in 2001. The majority of the Hominy Creek Greenway and Water Quality Park corridor is located within the 100-year floodplain along Hominy Creek. The City of Wilson acquired lands along the corridor from FEMA's Hazard Mitigation land buyout monies and these properties will be considered for public space improvements within the master plan. Map 1.1 depicts the project study area and adjacent connections.

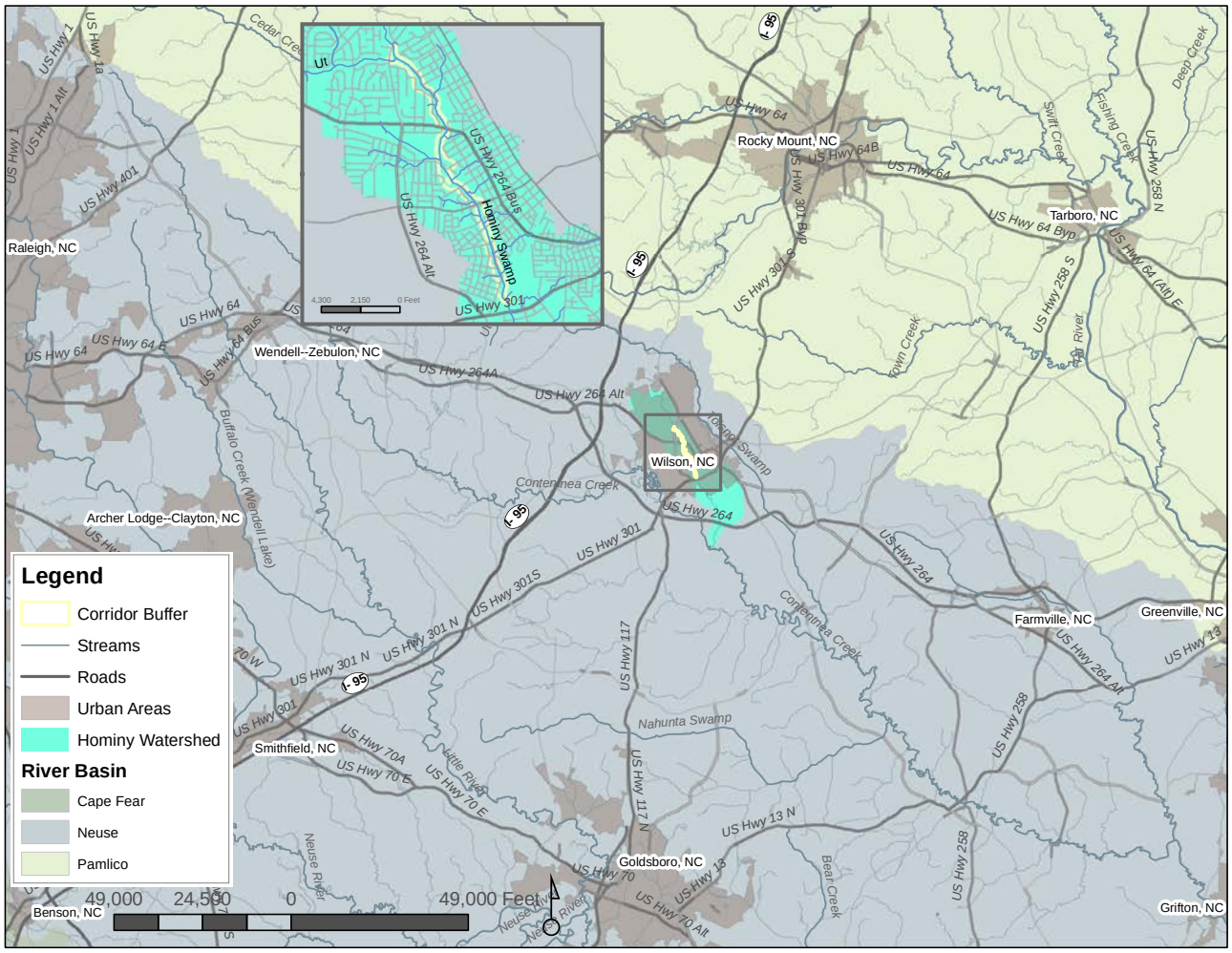
PROJECT PURPOSE AND GOALS

The Hominy Greenway is identified in the 2008 City of Wilson Comprehensive Bicycle Plan, 1993 Wilson Parks and Recreation Master Plan, and the City of Wilson 2030 Comprehensive Plan. These plans call for the greenway to run south to the Hackney Industrial Park and North to the Airport area and surrounding neighborhoods. When built, the entire greenway will be nearly seven miles long and the first greenway in the County or City of Wilson. For its initial phase, the greenway runs approximately three miles identified from the Cavalier neighborhood/Recreation Park area down to the Five Points neighborhood. In addition to providing a greenway trail facility for transportation and recreational use, it is desired that the greenway will impart outlets for education and stewardship with a focus on stream ecology, stormwater management, water quality, and healthy lifestyles.

The City of Wilson has the opportunity to attract and retain businesses and residents by providing quality of life elements, like this greenway and stormwater quality park. Developing trails and parks is an important and cost-effective part of a quality-of-life and economic development strategy for the City, and ultimately, the region. Additional master plan goals include using best management practices to reduce flooding and improve water quality, enhancing habitat along the stream corridor and delisting Hominy Swamp Creek from the 303(d) Impaired Waterbodies list. The preparation of this illustrative master plan will allow project stakeholders and potential funders in the Wilson region to establish a shared vision for completion of the Hominy Creek Greenway and Water Quality Park.

The master plan will provide a conceptual framework for developing the Hominy Creek Greenway and Water Quality Park. It will help prioritize and coordinate future investments and efforts to improve active lifestyles and enhance

MAP 1.1: PROJECT STUDY AREA



well-being in Wilson. The recommendations aim to:

- Showcase the Hominy Creek Greenway corridor to increase its value as a local educational and recreational resource
- Provide best practices for routing the Hominy Creek Greenway and Water Quality Park around sensitive riparian areas
- Use best management practices to reduce flooding and improve water quality in stormwater runoff
- Enhance and protect riparian buffer areas
- Improve water quality and aquatic habitat and achieve delisting of Hominy Swamp Creek from the 303(d) Impaired Waterbodies list
- Analyze roadway intersections and include safe, effective crossing treatments
- Provide connections to existing and future recreational, cultural, and historic areas of Wilson
- Improve quality of life through trails by encouraging opportunities for community, exercise, and connection to nature
- Maintain and protect natural resources and reduce greenway construction impacts

Hominy Swamp Creek was placed on the 303(d) list in 2004 due to a Poor bioclassification rating at two sites in 2001. The low rating is likely due to a combination of factors common in urban streams- flashy, erosive stormwater flows, chemical pollutant loads in stormwater runoff, high stream flow sediment loads, and deteriorated aquatic habitat. This master plan identifies stream reaches within the project area where riparian buffer restoration and stormwater control measures can be utilized to ameliorate these factors, and improve water quality and aquatic habitat.

PUBLIC AND STAKEHOLDER INPUT

The process began in spring 2015 and has been a cross collaboration of consultants, City Staff, and the general public. Aside from City staff input, the planning process included several other important methods of public outreach and involvement. Two public open houses were scheduled in combination with staff meetings, the first to introduce the project to the general public, and the second to present the recommendations of the illustrative master plan.

Citizens commented on areas they would like to see greenway connections, and areas that experience flooding along the project corridor.

Section 2

INVENTORY *and* ANALYSIS

OVERVIEW

The project team conducted a thorough in-field evaluation of the Hominy Creek project study area . Prior to entering the field, the team evaluated existing conditions using Geographic Information Systems (GIS) to determine land uses and resources adjacent to the study area. In the field, the team evaluated natural features (water, floodplains, wetlands, geology, and sensitive habitat), existing utilities (water, sewer, electrical, gas, telephone, etc.) roadway intersections, stream crossings, and circulation. Links to other trails, local parks, schools, local government buildings and private sector lands were also evaluated. Following fieldwork and inventory, opportunities and constraints were identified which could have impacts on trail development and stormwater controls.

GREENWAY DESTINATIONS

The following greenway destinations are listed as significant trip attractors for future users of the Hominy Creek Greenway. From parks and recreation to service centers, educational facilities, or major employers, each destination is less than a mile from the greenway and reachable by bicycle or on foot.

PARKS & RECREATION

Williams Day Camp

Owned by the City of Wilson and managed by its Parks and Recreation Department, Williams Day camp operates as an outdoor summer camp for children ages 5-12. This is Wilson County's only outdoor camps camp and it features hands on activities with insects, fish, reptiles and various other outdoor wildlife. This park also is the location of a disc golf course that is available from sunrise to sunset all year except for in the summer because of the summer camp.

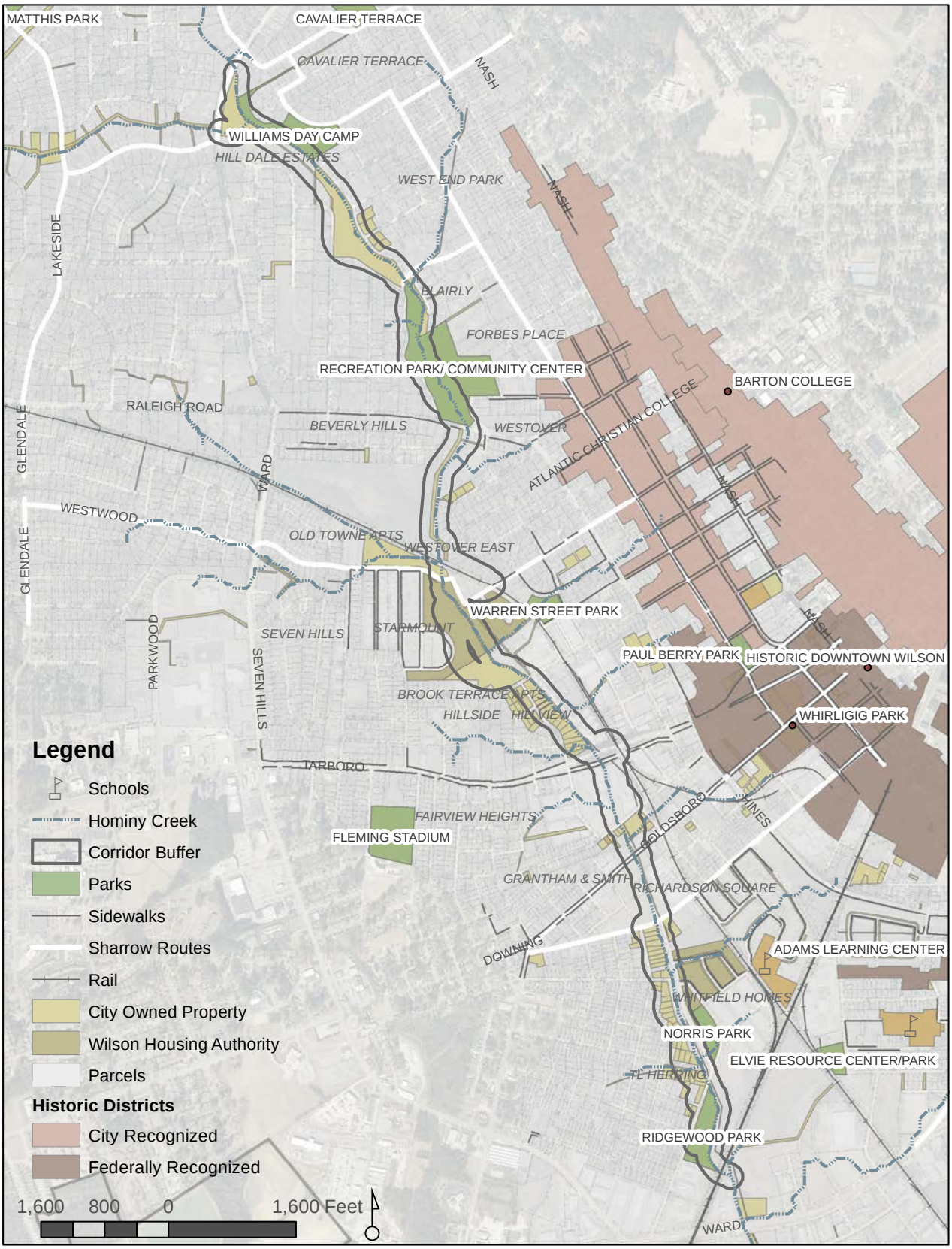
Recreation Park and Community Center

The Recreation Park Community Center, another property of the city of Wilson's Parks and Recreation Department, hosts a public pool, ten tennis courts, and basketball and futsal games. It is also the location where one can find schedules for park district sports game and clubs as well as information pertaining to local trails and parks.

Fleming Stadium Field

This site is home to the Historic Fleming Stadium that was built in 1939 for the first coastal Plain 'D' league baseball team; the Wilson Tobs. Today the stadium still hosts the Wilson Tobs of the Coastal Plain League, as well as the Post 14 American Legion Program and the North Carolina Baseball Museum. Showing over 100 baseball games a year, the site also hosts the Conference Carolinas Baseball tournament and the NCISA's spring single A Baseball championships.

MAP 2.1: PROJECT CORRIDOR



Warren Street Park, Norris Park, and Ridgewood Park

The proposed greenway alignment will also pass through a number of small parks that contain either a playground, a shelter, or open space. Warren Street Park contains a playground, walking trail, and basketball court. Norris Park contains a playground, basketball court, and open space. Ridgewood Park is primarily open space.

Whirligig Park

While assessing the strengths of the City of Wilson, it came to be apparent that the number one tourist attraction is the Vollis Simpson's "Whirligig Farm." In this realization the City decided to relocate the late artist's whirligigs to the federally-recognized historic downtown district in order for the public to have better access to these alluring artistic pieces and to entice visitors downtown. A Whirligig Park, designed by the landscape architecture firm Lappas + Havener, is scheduled for construction and will contain a central amphitheater, a park shelter for farmers markets, a water feature, seating, and gardens for public enjoyment.

SERVICE CENTERS

Historic Downtown Wilson

Historic Downtown Wilson features more than 25 historic buildings, churches and homes listed on the National Register of Historic Places. In April 15, 2010 a 2030 Comprehensive Plan for Wilson was adopted. The Comprehensive Plan analyzed the City's potential and demonstrated how Downtown Wilson can grow into a prospering city center through a focus on their historical architecture, thriving art culture, and current growing economy.

The drawing of the proposed downtown illustrates an emphasis on creating a pedestrian-friendly atmosphere with tree lined streets and a centralized green space. The Hominy Creek Greenway has the potential to connect many neighborhood residents to the historic downtown area via a scenic trail that is separated from busy roadway traffic. This increase in pedestrians and cyclists in

the downtown area will help to bring economic vitalization to the shops and businesses located in the area.

EDUCATIONAL FACILITIES

Barton College

Barton College is a four-year private liberal arts college, located in the city-recognized historic district. Established in 1902, the college became accredited in 1995 by the Southern Association of Colleges Schools Commission on Colleges. Approximately 1,000 students are enrolled in the school and there is about 200 faculty and staff. It is nationally recognized for its programs in education, deaf education, nursing, and social work. The college campus is 65-acres and contains athletic buildings, residence halls, the W.N. Hackney Library, the Kennedy Recreation & Intramural Center, and other state-of the art facilities.

Adams Learning Center and Daniels Learning Center

The Hominy Creek Greenway will be located nearby two schools with children under 16, allowing them the option to bike or walk to school. Located near the end of the proposed greenway along Walnut Street, Adams Learning Center is a public Grade School teaching kindergarten to 5th grade. Daniels Learning Center is a public Middle School teaching grades 6-8 and is just South of Adams Learning Center on Elvie Street.

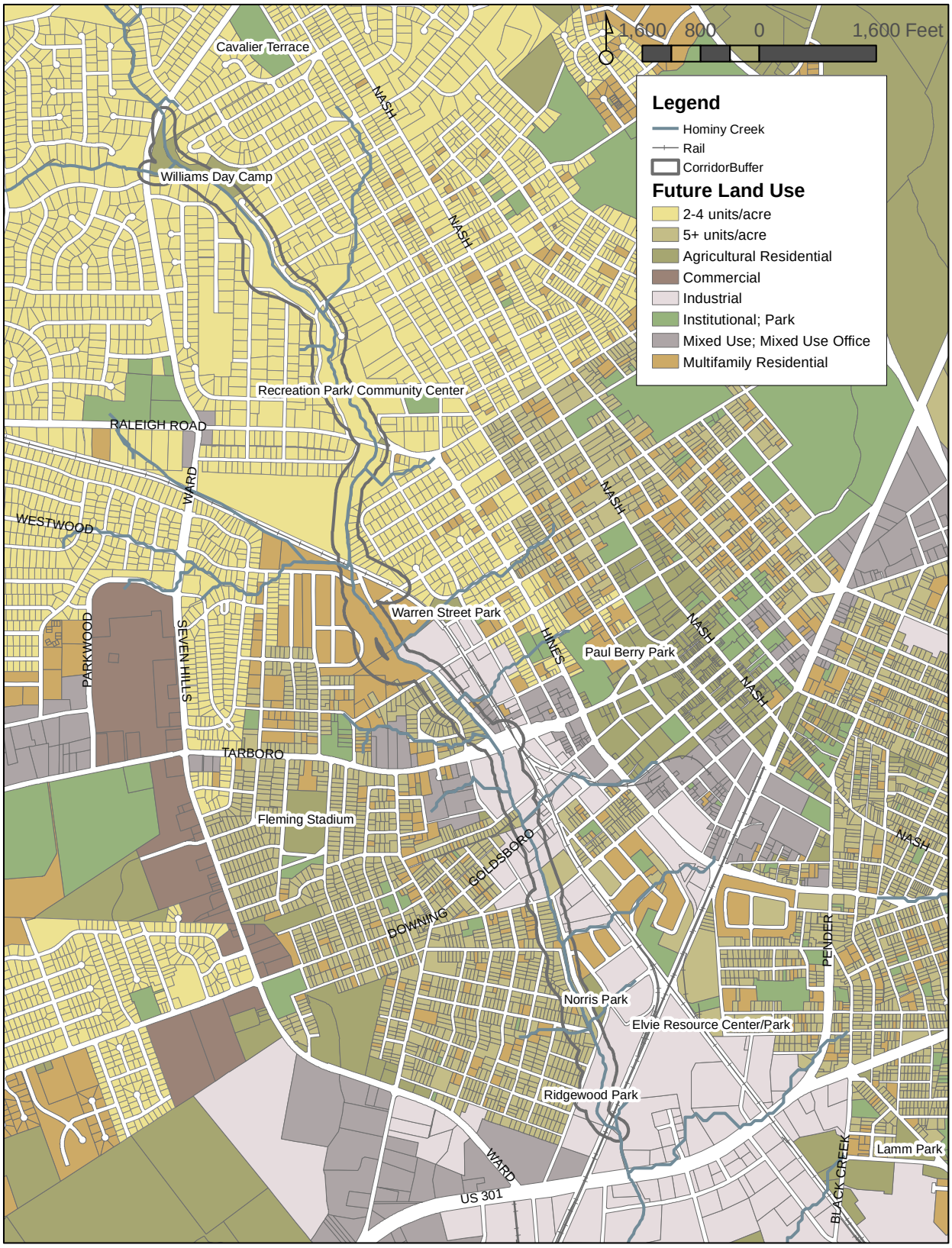
MAJOR EMPLOYERS

Previously known as "The World's Greatest Tobacco Market", today Wilson has a healthy mix of agriculture, manufacturing, commercial and service business. According to the City's 2011 Comprehensive Annual financial Report the following companies are major employers in Wilson:

- BB&T (Branch Banking & Trust) — Financial Services
- Wilson County Schools — Education
- Bridgestone — Auto and Truck Parts Manufacturer
- Wilson Medical Center— Hospital
- S.T. Wooten — Construction Services and Materials, specifically paving

Connectivity to these recreational, educational, and economic destinations was a key factor used to evaluate potential trail alignments. Roadways, creek corridors, and utility easements, all provide opportunities for connectivity between destinations throughout the Hominy Creek Greenway and Water Quality Park.

MAP 2.2: LAND USE INVENTORY



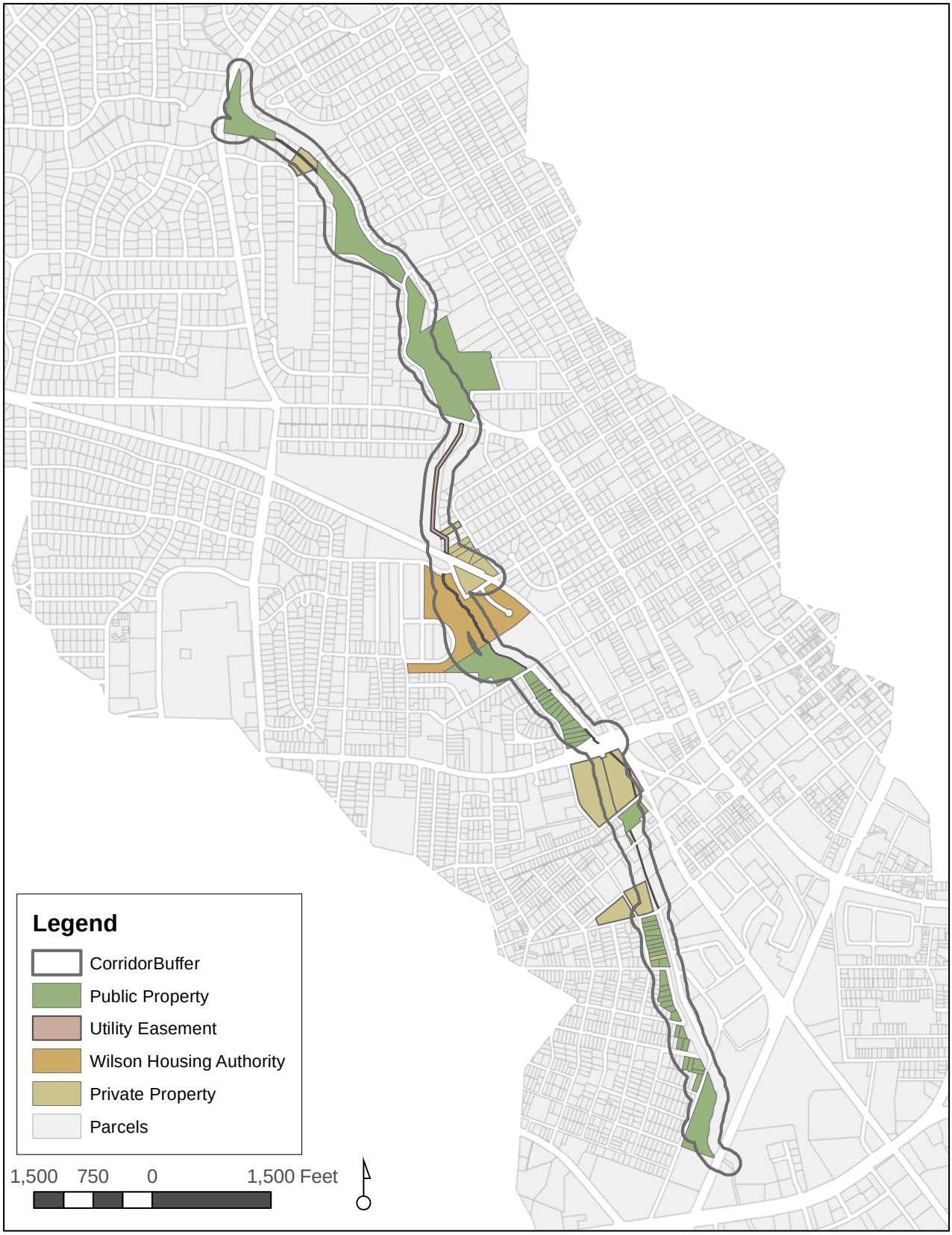
LAND USE

The corridor's study area intersects 243 parcels. Over 80% of the parcels are designated as residential land use, with 40% of the parcels designated as high-density residential, 35% as low-density residential, 6% as multifamily residential, and 3% as agricultural residential. The rest consists of Industrial at 13%, and mixed use office at 2%.

Sections 1-2 of the corridor is located primarily in a low-density residential area with 2-4 units per acre and agricultural residential. It crosses 91 parcels, 86 parcels with the land use designation of residential with 2-4 units /acre and 5 parcels designated as agricultural residential. A greenway could be easily implemented through this section of the trail as long as there is sufficient public involvement and conversation with the nearby residences and neighborhoods. The greenway will fit in nicely with this land use offering a scenic and natural experience while also allowing residential connection to a recreational and transportation amenity.

After crossing the Carolina Coastal Rail Line in section 3 of the proposed trail alignment the study corridor becomes a mix of multifamily residential, high density residential at 5+ units per acre, industrial and mixed use. The southern half of the corridor's study area contains 152 parcels with 97 as residential at 5+ units /acre and 15 as multifamily. The rest of the land use is industrial or mixed use office with 32 parcels designated industrial and 5 designated mixed use office. Section 4 is primarily industrial and mixed use. A greenway may not appear to blend into this space as readily as the residential areas. Currently many of the industrial spaces are unused and a trail passing by them could rejuvenate the area and cause them to be retrofitted for other uses as long as the zoning can be adapted to allow for it. These spaces could also be renovated as park or stormwater retention areas, since they are located in the floodway. Sections 5-6 are located in high density residential with 5+ units per acre. This area would be most easily incorporate a greenway and because of the density of the residences it will allow more people access to the greenway.

MAP 2.3: PARCELS AND OWNERSHIP



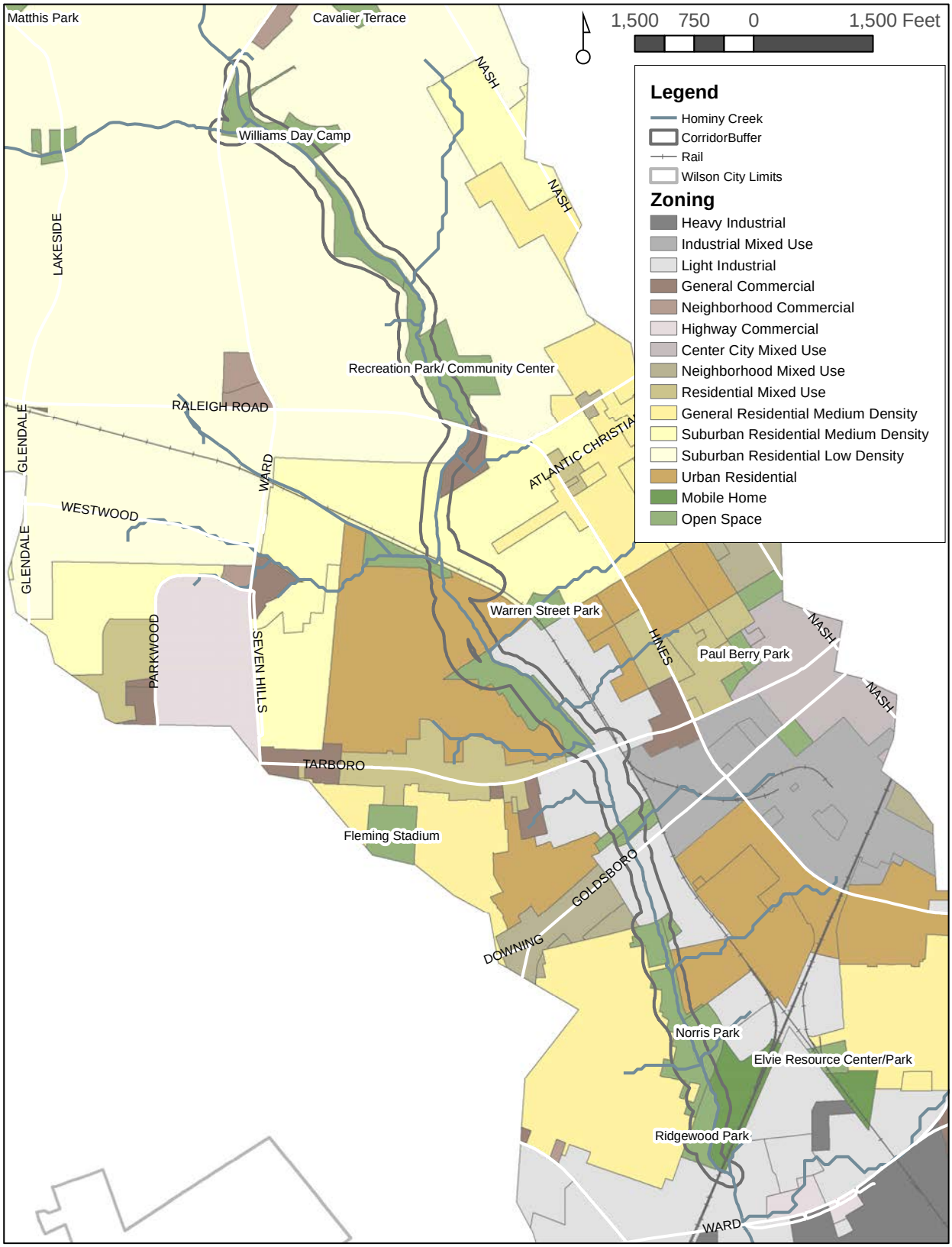
PARCELS AND OWNERSHIP

The Hominy Creek Greenway begins at Williams Day Camp and extends for 3.8 miles until Ridgewood Park. The construction of the Hominy Creek Greenway will generate significant connections for the residents of Wilson primarily due to its proximity to a number of neighborhoods and parks.

The proposed alignment of the greenway along with its trail connectors intersects 73 parcels. A majority of the parcels are city-owned property with the rest being residential, housing authority, or commercial property. Below is a breakdown of the property type of the intersected parcels along with length of the alignment, number of parcels, and percent of the trail.

Easements must be obtained when the trail alignment extends through residential or commercial property. Trail spurs to nearby neighborhoods and proposed trailheads connect through several unacquired residential or commercial properties.

MAP 2.4: ZONING



ZONING

According to the map on page 18, the study area is zoned for open space, residential (ranging in densities from low to medium and urban), and light industrial. Sections 1-3 of the study area are zoned primarily open space surrounded by low density residential, easily allowing for a greenway to be located. Section 4 is mostly zoned as light industrial. Most of what is zoned industrial is vacant and/or under utilized buildings that have redevelopment potential. Sections 5-6 of the study area returns to open space until it ends at Ward Blvd.

The 2030 Comprehensive Plan for the City of Wilson outlines the goal of protecting valuable environmental resources in their proposal for future land use. According to the plan this involves protecting critical environmental resources such as floodplain areas and wetlands, and using these opportunities for public use such as greenways, parks, and recreational areas.

The Hominy Creek Greenway will follow the action goals of the Comprehensive Plan and create an open space buffer that will enhance the water quality of the Hominy Creek as well as its wildlife and plant habitats. The greenway will also provide connectivity and a value-added amenity to commercial and residential properties.

GREEN INFRASTRUCTURE – STREAM & RIPARIAN ZONE

Existing Conditions

From the Hominy Swamp Creek Watershed Assessment and Restoration Plan, in 1999, the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP; formerly the NC Wetlands Restoration Program) received grant funding from the U.S. Environmental Protection Agency (EPA) to develop a watershed assessment and restoration plan for Hominy Swamp Creek. It was selected for the study in part because there were obvious nonpoint source water quality problems, the watershed appeared to have need and opportunity for watershed restoration planning, and there were noted concerns about flooding and associated resource and financial impacts in the City.

The EPA grant was used to develop a watershed assessment and management plan for the upper portion of Hominy Swamp Creek (KCI, 1999), and a stream restoration project was implemented adjacent to the Recreation Park/Community Center as a result of that assessment. An advisory group was convened in 2003 to solicit input and assistance from local area natural resources agency staff. A number of issues were discussed during meetings with the advisory group, and a list of goals was developed, including water quality and habitat improvements, education, land use and open space planning, and identifying funding sources for projects.

The watershed assessment and management plan (KCI 1999) states: “The stream system that makes up Hominy Swamp Creek has been extensively channelized over the past 50 years, and now serves mainly as storm water conveyance through the urbanized mid-portion of the watershed. Most headwater streams of the system are relatively undisturbed at present, but there is additional development pressure in the city as new residential and commercial developments encroach from the east and west. The mid and upper portions of the watershed have been largely built-out over the

past fifty years, and there are many complaints of residential flooding as the creek attempts to access its historical floodplain."

The current project stream corridor is surrounded by built-out areas that send large amounts of stormwater runoff to the creek. There is intact riparian forest present, especially in the upper reaches of the project area, however, there are many areas downstream that support little to no trees or woody vegetation. Invasive species such as privet (Ligustrum spp.), multi-flora rose (Rosa multiflora), mimosa tree (Albizia jullibrissen) and wisteria vine (Wisteria spp.) are common throughout.

Before development and channelization occurred there likely were large areas of wetlands adjacent to the stream, which meandered in a forest/swamp complex through the project area. Development, large stormwater flows and channelization have caused channel incision throughout the project area. Stream bank heights range from approximately 5 to 12+ feet. While scattered wetlands occur along the project reach, the incision caused by erosion from high stormwater flows and the resulting lower channel elevation or invert has effectively lowered the adjacent riparian zone water table, similar to how a drainage ditch would, and drained many of the pre-disturbance wetlands that likely existed.

CURRENT CONDITIONS, STREAM EVALUATION, PROCESS, & RESULTS

In order to evaluate the project corridor based on the scope, Biohabitats performed a field survey and characterized existing conditions on Hominy Swamp Creek and the riparian zone using an adaptation of the Unified Stream Assessment: A User's Manual Version 2.0 (2005). The Unified Stream Assessment is a rapid visual assessment technique developed by the Center for Watershed Protection, to locate and evaluate problems and restoration opportunities within an urban stream corridor.

For the purposes of this survey, the Hominy Swamp stream was divided into 11 sections or reaches, with origins and endpoints as follows:

1. From the project origin, at the confluence of the two branches just downstream from Ward Boulevard to the downstream property line of Williams Day Camp,
2. From Williams Day Camp to the upstream point where the restored reach begins, at Kincaid Avenue,
3. From Kincaid Avenue to Raleigh Road (restored reach),
4. From Raleigh Road to Elizabeth Road,
5. From Elizabeth Road to Park Avenue,
6. From Park Avenue to Tarboro Street,
7. From Tarboro Street to Mercer Street,
8. From Mercer Street to Goldsboro Street,
9. From Goldsboro Street to Lodge Street,

10. From Lodge Street to Aycock Street,
11. From Aycock Street to the end of project at the railroad trestle crossing.

Stream Stability and Stormwater Retrofit Field Survey

The methodology used for stream stability assessment was adapted from the Unified Stream Assessment: A User's Manual Version 2.0 (2005). It is a rapid visual assessment technique developed by the Center for Watershed Protection, to locate and evaluate problems and restoration opportunities within an urban stream corridor. The USA assesses the eroding banks along the survey reach, particularly at places where valuable infrastructure is threatened. The protocol facilitates the identification of potential stream restoration or repair opportunities such as bank stabilization or grade control. Specifically, components of the Bank Erosion protocol were incorporated in the field project field survey. The criteria and point system used in the field survey are below.

POINTS 5	4	3	2	1
ACTIVE DOWNCUTTING; TALL BANKS ON BOTH SIDES OF THE STREAM ERODING AT A FAST RATE; EROSION CONTRIBUTING SIGNIFICANT AMOUNT OF SEDIMENT TO STREAM; OBVIOUS THREAT TO PROPERTY OR INFRASTRUCTURE.		DOWNCUTTING EVIDENT, ACTIVE STREAM WIDENING, BANKS ACTIVELY ERODING AT A MODERATE RATE; NO THREAT TO PROPERTY OR INFRASTRUCTURE		GRADE AND WIDTH STABLE; ISOLATED AREAS OF BANK FAILURE/EROSION; LIKELY CAUSED BY A PIPE OUTFALL, LOCAL SCOUR, IMPAIRED RIPARIAN VEGETATION OR ADJACENT USE.

The point system assigns more points for actively eroding, unstable stream reaches, and less points for less erosive or more stable bank conditions, to characterize the degree of erosion taking place.

After field review and reconnaissance, each reach was assigned a score based on the composite or overall condition of the reach. Factors taken into consideration when visually assessing each reach were drawn from fluvial geomorphologic (stream geometry) indicators of stream stability/instability including:

- Presence and elevation of apparent bankfull indicators,
- Degree/ apparent depth of channel incision, based on the top of bank elevation,
- Bank stability including bank height, bank angle, degree of vegetative bank protection, evidence of mass wasting,
- Excessive sediment deposits in stream bed
- Mid-stream bars,
- Apparent high width/depth ratio and,
- Evidence of recent disturbance

When evaluating each individual stream reach, in many instances stream channel characteristics were observed that varied between the "Point" values in the assessment technique. As an example, a portion of a reach may have been evaluated as having 5 points, with actively eroding banks 7-8 feet tall, but the remainder of the reach was evaluated as having 4 points with actively to moderately eroding banks 5-6 feet tall. In such cases, an average of the two point totals was assigned to the reach, or in this example, 4.5 points.

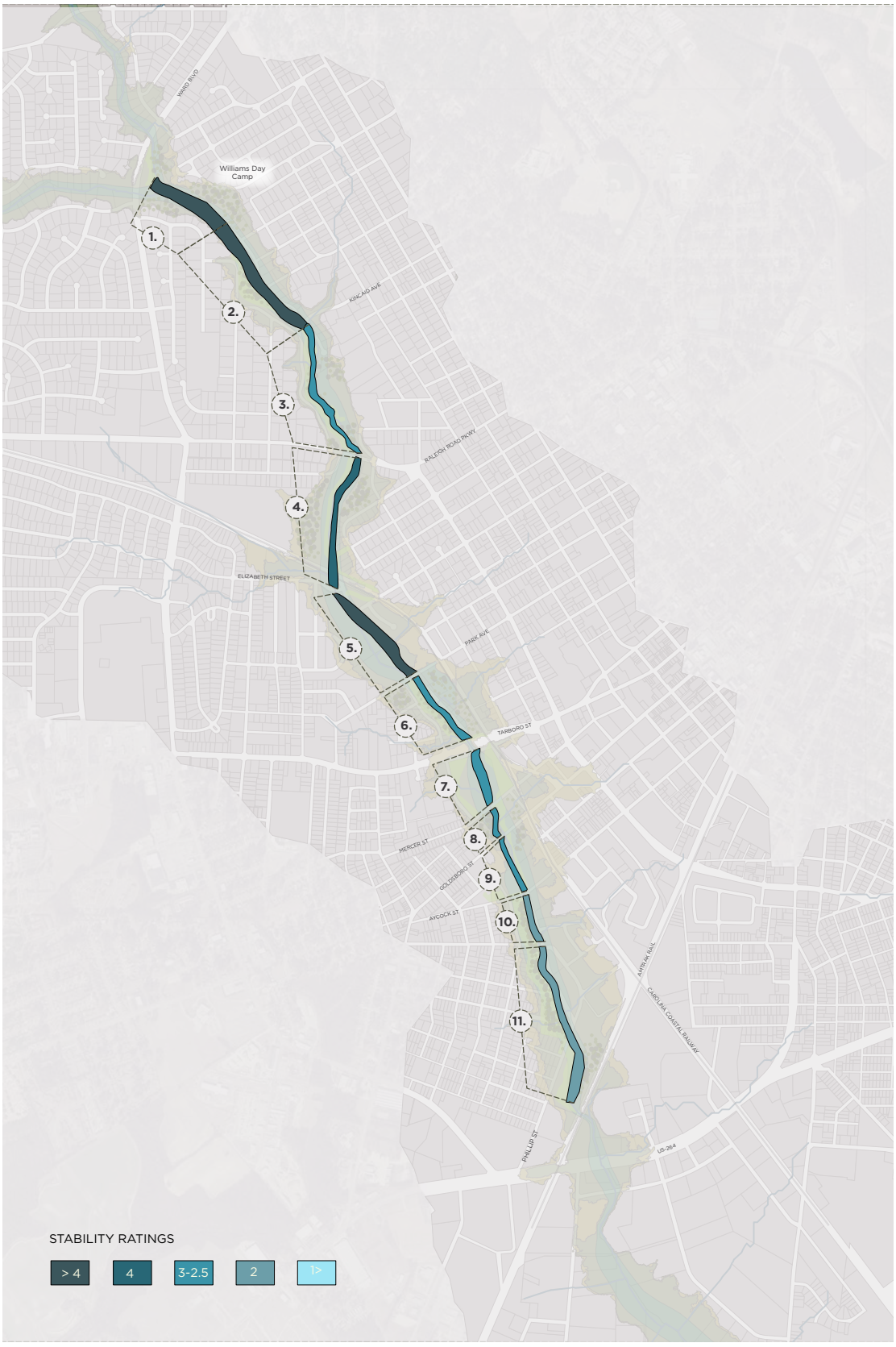
The scores for the individual reaches are included in Table 2.1, and a map illustrating the reaches is shown on the facing page.

More detailed comments about the stability of each reach, its suitability for stream restoration, and stormwater retrofit opportunities follow. When reference is made to a left bank or right bank, the convention is facing downstream.

TABLE 2.1: STABILITY RATINGS BY REACH

Stream Reach	Reach Location	Reach Score
1	Project origin to Williams Day Camp	4.5
2	Williams Day Camp to Kincaid Avenue	5
3	Kincaid Avenue to Raleigh Road	3
4	Raleigh Road to Elizabeth Road	4
5	Elizabeth Road to Park Avenue	4.5
6	Park Avenue to Tarboro Street	2.5
7	Tarboro Street to Mercer Street	2.5
8	Mercer Street to Goldsboro Street	2.5
9	Goldsboro Street to Lodge Street	3
10	Lodge Street to Aycock Street	2
11	Aycock Street to project end at railroad crossing	2

MAP 2.5: STREAM REACHES



Reach 1: Project Origin to Williams Day Camp

The upstream point of the project, and of this reach, is at the confluence of two channels that flow under Ward Boulevard to the north and west, and then to the confluence, each approximately 400 and 500 feet respectively. Channel incision has resulted in banks averaging 5-6 feet through this reach. Banks are steep, almost vertical in places, and eroding throughout the reach. A sewer main parallels the stream on the right bank starting at the confluence, then crosses over the stream to the left bank further downstream. The location of the sewer line and the presence of large riparian trees present challenges to stream restoration or stabilization activities, however, they do not preclude those activities entirely.

The stability rating of 4.5 reflects the vertical, eroding banks and the channel incision in this reach.

The City of Wilson Stormwater Department has identified a potential stormwater retention, water quality BMP site just upstream of the confluence of the two tributaries mentioned.

Looking downstream from the confluence of the two channels, at the project origin

Reach 2: Williams Day Camp to Kincaid Avenue

The stream is bordered on the left bank by Canal Drive, and on the right bank by the sanitary sewer and sewer easement. The depth of channel incision (and the resultant bank heights throughout this reach) are also 5-6 feet. The channel appears overwide, from stream bank erosion. Steep to vertical, eroded banks are common throughout the reach. There are areas where stream bank erosion may threaten the integrity of the Canal Drive road bed in the future. This reach is a candidate for stream stabilization, where the road bed is proximal to the eroding stream banks. Challenges to stream bank stabilization are large trees and the road/sewer infrastructure itself.

The lowest stability rating of 5 reflects the steep, eroding banks that are threatening Canal Drive, and the channel incision in this reach.

There are two parcels on the east side of Canal Drive that are owned by the City where stormwater BMP retrofits have been proposed by the City. These are relatively large lots, with approximately 300’ of frontage on Canal Drive between Pinewood Drive and Clyde Avenue and approximately 250’ of frontage south of Clyde Avenue.

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Stormwater outfall from Canal Street emptying into the creek in Reach 2

Reach 3: Kincaid Avenue to Raleigh Road

This reach has been restored previously by the State of North Carolina and there is a conservation easement on the stream and buffer areas. This precludes stream restoration and stabilization and stormwater BMP retrofits within 50 feet of the top of bank of the stream.

The stability rating of 3 reflects the presence of vertical, moderately eroding banks in some places along this reach.

Reach 4: Raleigh Road to Elizabeth Road

Channel incision downstream of the Raleigh Road crossing has created bank heights of 10-12 feet. A sanitary sewer line and easement is on the right bank for most of this reach, until just upstream of the railroad crossing, where the sewer crosses over to the left bank. There are mature trees on the left bank on most of this reach, to the point where the sewer alignment crosses the stream, near the Deans Street access, and the maintained sewer easement continues on the left bank to Elizabeth Road. There is a fenced area on the right bank for approximately 500 feet downstream of Raleigh Road. There is a narrow riparian buffer on the right bank with mature trees, adjacent to the fenced area, which has held that bank in place reasonably well during high flows. Approximately 175 feet downstream of the fenced area, trees apparently have been removed from the bank, and mass wasting is occurring in multiple locations farther downstream, to the location where the sewer crosses over to the left bank. This area is actively eroding and will continue to erode until it is stabilized and woody vegetation is reestablished.

The low stability rating of 4 reflects the presence of nearly vertical, actively eroding banks in some places along this reach, and the high degree of incision observed.

Looking upstream, approx. 175 feet downstream of the fenced area- eroding banks

Reach 5: Elizabeth Road to Park Avenue

This reach varies in depth of incision, from 8-12 feet. The banks on both sides are steep, with bank angles greater than or equal to 75 degrees in places. Riparian vegetation is mowed along most of this reach, and woody vegetation is lacking. There is a wide, undeveloped floodplain, with room to restore or stabilize the channel, however, with the depth of incision, restoration of sinuosity would require extensive excavation and earth removal.

The stability rating of 4.5 reflects the presence of vertical, moderately eroding banks in some places along this reach and the high degree of channel incision observed.

This reach has been identified by the City of Wilson as a site for a large-scale BMP complex, where excavation could create multiple stormwater wetland/retention areas on both sides of the floodplain and stream restoration, conceptually along the entire reach. This multipurpose concept would potentially combine water quantity and quality benefits, along with recreational opportunities created by park areas and greenway alignments

Looking downstream from Elizabeth Street crossing

Reach 6: Park Avenue to Tarboro Street

The right bank is City-owned property, with mature trees and mowed maintenance from top of bank landward. The channel is incised approximately 10 feet throughout. Dense willow and elderberry vegetation on both banks support bank stability, however, mid-channel bars created by excessive sediment loads threaten bank stability under high flows. Under current conditions, stream restoration or BMP retrofit opportunities are limited, due to lack of working space lateral to the channel, especially on the left bank. Woody species could be added to the buffer, however, the existing vegetation has stabilized this reach to a great extent, and resources could be used more beneficially elsewhere.

The City has identified properties on the left bank for acquisition which would create lateral space for stormwater BMP retrofits and stream/buffer restoration.

The stability rating of 2.5 reflects the presence of vertical, moderately eroding banks in some places along this reach, and the presence of mid-channel bars.

Looking downstream from the Park Avenue bridge.

Reach 7: Tarboro Street to Mercer Street

In this short reach, both banks are built out, constraining stream restoration, buffer restoration and BMP opportunities under the current conditions.

The City has identified properties on this reach for acquisition which would create lateral space for stormwater BMP retrofits and stream/buffer restoration.

The stability rating of 2.5 reflects the presence of generally less steep, moderately eroding banks in some places along this reach, and the presence of mid-channel bars.

Looking upstream from the Mercer Street bridge.

Reach 8: Mercer Street to Goldsboro Street

This is a very short reach relative to the project scale, with substantial development, limiting the scope of stream or buffer restoration under current conditions.

However, a City-owned vacant lot on the left bank just upstream of the carwash on Goldsboro Street has been identified as a potential site for a BMP that could treat runoff and mediate high flows from downtown by daylighting a stormwater pipe that traverses the site.

The stability rating of 2.5 reflects moderately eroding banks, especially at the toe of slope, the depth of incision (8-12 feet), and the presence of mid-channel bars. The stability rating would be higher but for extensive native elderberry and willow stands on the banks, which increase overall bank stability.

Looking downstream towards Goldsboro Street from the Mercer Street bridge.

Reach 9: Goldsboro Street to Lodge Street

This reach is characterized by development on the upstream end, and impacted buffers on the downstream end. Under present conditions, stream restoration is limited due to lack of space, but buffer restoration/bank stabilization is feasible on the lower end of the reach.

Under current conditions, no stormwater retrofit opportunities were identified on this reach.

The stability rating of 3 reflects moderately eroding banks, the steepness of the banks, the depth of incision (8-12 feet), and the presence of mid-channel bars.

Looking upstream from the Lodge Street bridge towards Goldsboro Street.

Reach 10: Lodge Street to Phillips Street

This is a relatively long reach, where the riparian buffer is periodically maintained by mowing. As a result, full sun produces vigorous regrowth, but the regular maintenance does not allow woody vegetation to mature and extend its stabilizing roots along the banks. Under current conditions, stream restoration and stormwater retrofit opportunities are limited along this reach due to the presence of Norris Boulevard on the left bank of the stream and Malpass Drive along much of the right bank. Also, under current conditions, allowing the woody vegetation in the buffer to mature will help with streambank stability.

The City owns much of the property on the right bank along Malpass Drive and some of the property on the left bank along Norris Boulevard. This area has been identified as a site for a large-scale stormwater BMP retrofit/stream restoration/buffer restoration complex.

The stability rating of 2 reflects the presence of toe of slope erosion occurring in some places along this reach, and the presence of mid-channel bars. Stream banks are generally 8-10 feet high, but they are not as steep as in upstream reaches, and erosion is not as widespread.

Looking downstream from the Lodge Street bridge.

Reach 11: Phillips Street to Project Terminus

This reach is similar in bank height, bank slope, and channel geometry to Reach 10. Periodic cutting of the riparian vegetation along this downstream reach limits mature woody vegetation development. There is a power line easement along the left bank that is somewhat of a constraint to stream restoration, but the City owns the parcel on the right bank, which would allow for realigning the stream channel and restoring sinuosity, if needed, for stream restoration A stormwater BMP retrofit may could be possible under the power line, in the easement.

No apparent stormwater retrofit opportunities were identified for this reach.

The stability rating of 2 reflects the presence of less vertical, moderately eroding banks in some places along the reach, and the presence of mid-channel bars.

Looking downstream from the Phillips Street bridge.

RIPARIAN ZONE EVALUATION PROCESS, & RESULTS

Generally, riparian zones in natural, undisturbed stream systems in the coastal plain physiographic region support woody vegetation in the form of native trees and shrubs. Mature trees and shrubs have extensive root systems that provide important stabilization structure to soil. Also, research has shown that mature native woody vegetation enhances nutrient uptake in stormwater flows. The shade from a forest canopy provides beneficial cooling of stream waters, and the organic matter from leaves, roots, branches and even trunks of trees supplies food for stream insects, which are foundational aquatic ecology species. Riparian buffers, especially those that are 50 feet wide or wider, are recognized as being very important to water quality, aquatic ecological health and aesthetics.

As should be expected in a highly developed watershed, the riparian buffer zone of Hominy Swamp Creek has been impacted, an accumulation of disturbance over decades, if not hundreds of years. One major impact to this system has been the alignment of sanitary sewer lines next to the stream and the common maintenance practice of mowing them to facilitate access, which prevents trees and shrubs from gaining beneficial size. Increasing stormwater flows due to impervious surface increases in the watershed are another more subtle and gradual impact that development has had on the riparian buffers. As increasing storm flows caused the channel bed to erode vertically, bank heights increased, and bank angles became steeper. Even with established mature trees in some locations of the riparian zone, channel incision and consequent bank failures have resulted in increased sediment loads being delivered to the stream and loss of existing vegetation to bank erosion and mass wasting. And finally, a third major impact to riparian buffers are invasive species such as privet, wisteria and multiflora rose, to name a few, that crowd out native tree species, provide little shade, and degrade wildlife habitat.

Some of the parameters for buffer evaluation were taken from the Unified Stream Assessment: A User's Manual Version 2.0

(2005). Other were developed based on site and watershed-specific characteristics. Riparian buffer widths were categorized based on the following criteria:

1. >50' width
2. <50' width
3. <25' width
4. no forested width

Riparian buffers were scored based on the following criteria:

1. *minimal impacts, at least 50 feet of wooded buffer that provides shade for channel, few if any invasives, basically undisturbed, no land use conflicts*
2. *marginal impacts, at least 50 ft. of wooded buffer, with minimal exceptions, small interruptions of shade for channel, few invasives, few if any land use conflicts*
3. *moderate impacts, at least 50 ft. of wooded buffer for ≥ 50% of length, interruptions of shade on channel common, invasive percent cover < 30%, light to moderate land use conflicts*
4. *substantial impacts, buffer has significant interruptions for over 50% of length, marginal shade on channel, invasive cover higher than 25%, up to 50% of area has land use conflicts*
5. *severe impacts, buffer has significant interruptions over most or all of its length, little to no shade on channel, invasive % cover greater than 30%, > 50% of area has land use conflicts*

Table 2.2 summarizes the results of the field riparian buffer survey.

A buffer width (left bank or right bank) less than 50 feet (category 2 or more, highlighted) or a riparian buffer score of 3 or more (highlighted) indicates a buffer that is a candidate for enhancement or restoration.

The field evaluation results serve to illustrate that buffers throughout the project area would benefit from enhancement or restoration. This is not uncommon or unexpected, in a highly developed watershed. If buffers are considered alone (without consideration of potential stream restoration or stabilization projects), the most accessible and cost efficient buffers to rehabilitate are in the lower reaches of the project area, specifically reaches 6-11, where mowing maintenance is practiced, at the expense of allowing native volunteer woody vegetation such as willow (Salix nigra), red maple (Acer rubrum), sycamore (Platanus occidentalis) to grow and mature on the stream banks. If mowing is discontinued, many areas, over the course of 5-10 years, may vegetate themselves naturally and provide greater stability to the existing stream banks.

TABLE 2.2 BUFFER WIDTH AND SCORE SUMMARY

Stream Reach	Reach Location	Left Bank Forested Width	Left Bank Buffer Score	Right Bank Forested Width	Right Bank Buffer Score
1	Project origin to Williams Day Camp	3	2	1	3
2	Williams Day Camp to Kincaid Avenue	3	1	2	2
3	Kincaid Avenue to Raleigh Road	2	2	2	2
4	Raleigh Road to Elizabeth Road	1	3	1-3	1-2
5	Elizabeth Road to Park Avenue	3	4	3	4
6	Park Avenue to Tarboro Street	4	5	2	3
7	Tarboro Street to Mercer Street	4	5	4	5
8	Mercer Street to Goldsboro Street	4	3	2	3
9	Goldsboro Street to Lodge Street	3	4	3	4
10	Lodge Street to Aycock Street	4	4	3	4
11	Aycock Street to project terminus	4	4	4	4

Many residents are already using the sewer easements for walking.

Literature Cited:

- KCI Inc. 1999. Hominy Swamp Creek Watershed Management Plan. KCI Inc. Raleigh, NC.
- Kitchell, A. and T. Schueler. 2004. Unified Stream Assessment: A User's Manual. Version 1.0. Urban Subwatershed Restoration Manual Series: Manual 10. Center for Watershed Protection. Ellicott City, MD.

Section 3

RECOMMENDATIONS

HOMINY CREEK GREENWAY & WATER QUALITY PARK MASTER PLAN

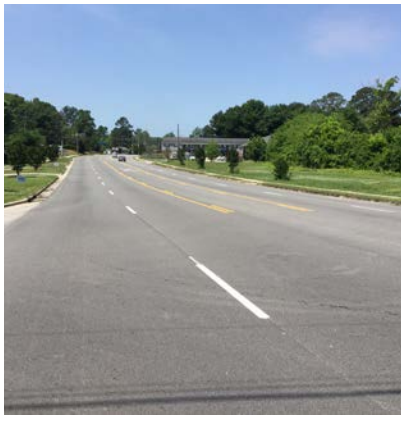
The purpose of the Hominy Creek Greenway & Water Quality Park Master Plan is to articulate a vision for a shared-use greenway and water quality park along the Hominy Creek.

The water quality park and greenway will fulfill multiple goals of providing a recreational amenity, wildlife habitat, improving water quality, and reducing stormwater quantity. The resulting master plan (Map 3.1) provides the greatest number of connections and benefits to trail users while meeting goals to reduce flooding and improve water quality in Hominy Creek. The proposed master plan is also successful in providing peripheral benefits to its users such as opportunities for economic development and adaptive re-use to otherwise undervalued floodplain property, environmental education, connection to and awareness of the environment, and maintenance and visibility of this valuable public facility.

The greenway will connect to existing uses, including neighborhoods, parks, and recreation facilities in Wilson.

PROJECT OPPORTUNITIES

- The corridor offers numerous connections to adjacent existing parks and public use
- Many stormwater retention possibilities exist along both sides of Hominy Creek
- South of Warren St., there are opportunities for the greenway to loop
- There is opportunity for a rail with trail beneath Tarboro Rd. due to the short track that is seldom used
- Tobacco flavoring industrial site at Tarboro Rd. floods often, and a land swap with the City is a possibility
- Large stormwater retention possibilities exist east of Hominy Creek between Norris Park, Ridgewood Park, and the existing storage facility
- Existing public housing will be relocated with in areas with flooding potential which opens opportunities for public parkland
- Much of the corridor and adjacent lands exist along publicly owned property
- The banks of Hominy Creek offer wide shoulders for greenway development, which will minimize grading, disturbance, and impacts



Tarboro Rd. is a significant barrier for the greenway. Alternatives to crossing this roadway are recommended.

PROJECT CONSTRAINTS

- Floodplain development permits will be necessary for much of the project study area
- The majority of the corridor is located in 100-year floodplain, and seasonal flooding along the greenway should be anticipated in the future
- Ward Blvd. is high volume roadway, requiring extra measures for greenway access facilities

- Tarboro Rd. is a very dangerous high volume road, and crossing safely will be very challenging
- Easements from private property owners will be necessary near Warren St. neighborhood
- Stormwater facilities along the corridor will require substantial funding and permitting
- While much of the corridor is publicly owned, there are areas that will require acquisition for the project to be fully executed in its recommended form

HOMINY CREEK GREENWAY & WATER QUALITY PARK CONCEPTS

This section presents recommendations for the concept design of the Hominy Creek Greenway and Water Quality Park. Special attention is given to how users will perceive the built and natural environments surrounding the proposed greenway, how citizens will use it, and how greenway use and stormwater improvements will impact the surrounding built and natural environments. The proposed Hominy Creek Greenway and many of the stormwater features extend along public lands and rights-of-way whenever possible. The greenway alignment is contingent upon stormwater and flood control design and construction. Where possible, the greenway should be constructed in tandem with stormwater improvements.

The illustrative master plan (shown on the following maps) is conceptual in nature and is not intended to be an exclusive design. When the project enters the design and construction phase, additional study will be required of each phase to determine actual stormwater and greenway design. A professional land survey will reveal information not available during the course of this study, and changes are inevitable as a result. Additional coordination and negotiation with adjacent property owners and regulatory agencies will also be necessary prior to final design.

Once constructed in the recommended form, the Hominy Creek Greenway and Water Quality Park will connect neighborhoods, seven parks, Hominy Creek, and downtown Wilson services, including retail, restaurants, and accommodations. The alignment totals 4.4 miles.

Stream Restoration, Stormwater BMP's, and Buffers

A summary of present conditions in the project area include a highly developed watershed, that generates erosive, high volume, flashy stormwater flows during larger precipitation events, a stream characterized by channelization, low streambed elevations due to channel incision, high, steep and eroding banks, and buffers impacted by disturbance, development, and invasive species. While these challenging conditions are pervasive throughout the project area, there are many opportunities for stream restoration, stream stabilization, stormwater BMP retrofits and buffer rehabilitation. For the purposes of these recommendations, stream restoration is defined as reconfiguring all three aspects or parameters of channel geometry- plan (sinuousity based on an undisturbed, reference stream's meanders), profile (channel bed elevations, restoring

natural riffle/pool sequences) and dimension (proper channel cross-sectional dimensions based on an undisturbed reference stream and modeling of stormwater flows associated with high precipitation events). Restoration in highly developed watersheds is often constrained by infrastructure and the lack of lateral available space to create natural meanders in a stream that has been previously channelized and straightened.

Stream stabilization is defined as repairing 2 of the 3 channel geometry parameters, which in urban stream settings is usually profile and dimension, given the usual lack of available lateral space to create meanders mentioned above.

Stormwater BMP retrofits are defined as structural stormwater practices, such as those typically found in State and Municipal level stormwater manuals, which control water quantity and improve water quality by removing excess nutrients, sediment and other pollutants

Buffer restoration is defined as planting woody vegetation beside the stream equal to or greater than 50 feet in width. Buffer enhancement is defined as planting woody vegetation in areas where the total available width beside the stream is less than 50 feet, or eradicating or controlling invasive species in the buffer area.

Based on the results of the field survey, every reach is a candidate for some form of buffer restoration or enhancement, if the only work done is to control invasive species.

Table 3.1 is a summary of stream restoration, stream stabilization, stormwater retrofit and buffer restoration and enhancement opportunities for the project area. Highlighted cells indicate good opportunities for work that can improve water quality (Moderate to High).

TABLE 3.1: STREAM RESTORATION/STABILIZATION, STORMWATER BMP RETROFIT AND BUFFER RESTORATION/ ENHANCEMENT OPPORTUNITY POTENTIAL BY REACH– LOW, MODERATE (MOD) OR HIGH

Stream Reach	Reach Location	Restoration	Stabilization	BMP	Buffer
1	Project origin to Williams Day Camp	Low	Low-Mod	High	High
2	Williams Day Camp to Kincaid Avenue	Low	Moderate	High	High
3	Kincaid Avenue to Raleigh Road	None	None	Low	High
4	Raleigh Road to Elizabeth Road	Low	Moderate-High	Low	High
5	Elizabeth Road to Park Avenue	Mod-High	High	High	High
6	Park Avenue to Tarboro Street	Mod-High	High	High	High
7	Tarboro Street to Mercer Street	Low	Low	High	Low
8	Mercer Street to Goldsboro Street	Low	Moderate	High	Moderate
9	Goldsboro Street to Lodge Street	Low	Moderate	Low	Moderate
10	Lodge Street to Aycock Street	Mod-High	Mod-High	High	High
11	Aycock Street to project terminus	Mod-High	Mod-High	High	High

In the following recommendations, the stormwater concepts developed by the City and this master planning process are presented and estimates of stormwater best management practice capacities and performance are presented. The capacity and performance data is intended to provide the reader with generalized, concept-level capacity and performance numbers. As the design of each of the BMP concepts progresses and develops in the future, the capacity and performance information will become more refined and accurate.

SECTION 1: GREENWAY RECOMMENDATIONS

Starting at Ward Blvd, **the propsed trail will run through Cavalier Terrace and Hill Dale Estates Neighborhoods connecting 3,758 people.** The trail winds through wooded areas followigng the creek and **connecting residences to William's Day Camp** and ending at Kincaid Road.

From the north, the greenway is proposed on the west side extending into the sewer easement southward. Because this is the northern terminus of the project, a **small parking area for 10-12 vehicles is recommended** which will provide access to the greenway. Due to the location in the floodplain, and to accommodate the widest range of users, a 10-foot-wide concrete tread is recommended for the proposed Hominy Creek Greenway. In areas where the trail meanders out of the floodplain asphaltic concrete may be used. A trail spur using an existing pedestrian bridge will connect users to Williams Day Camp. Another spur is recommended to connect with Hilldale Estates neighborhood to the west.

IMPACTS:

DEMOGRAPHICS

Overall Population: **3,758**

Households without Cars: **20**

Youth Under 18: **866**

Low-Income Households: **77**

Minorities:**232**

CONNECTIONS

Williams Day Camp

Hill Dale Estates

Cavalier Terrace Neighborhood

COST CONSIDERATIONS:

Approximate Length: **0.5 miles**

2,842 feet Asphalt Greenway: **$200** per linear foot

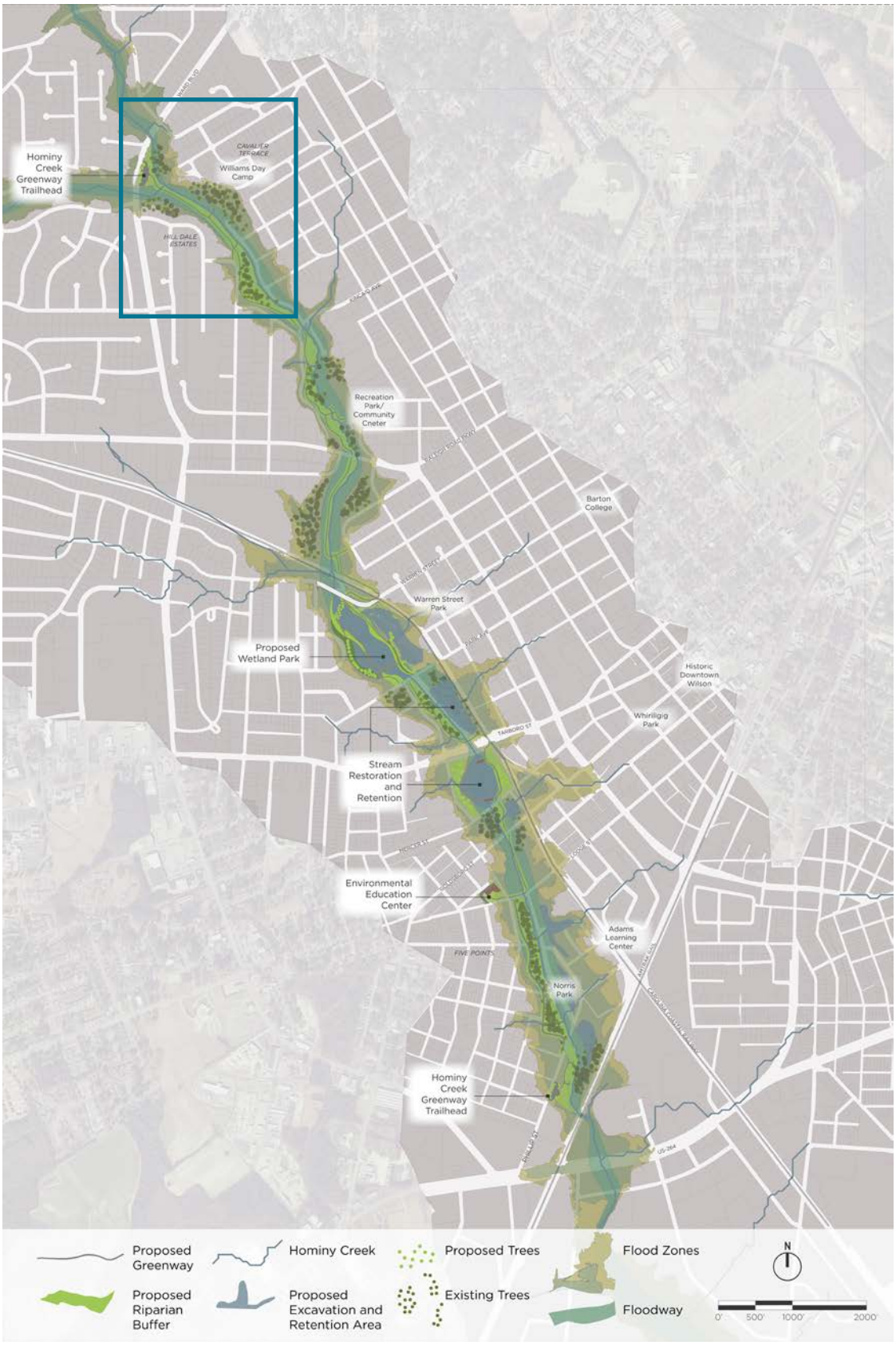
3 Pedestrian Bridge Upgrades: **$75,000** per bridge upgrade

1 Trailhead with 10 Parking Spaces:**$60,000-$75,000**

Design and Engineering: **12%** of construction cost

2016 Budget Estimate :$750K- $945K

SECTION 1: OVERVIEW MAP



SECTION 1: WATER QUALITY RECOMMENDATIONS

The riparian buffer is limited on the west bank by an existing sewer easement. The presence of the sewer line and large, mature trees in the buffers present probable regulatory and logistical constraints to stream restoration and to an extent, stream stabilization. However, buffer enhancement through control of invasive species is possible. The City has identified an area upstream of the confluence at the project origin, which is a potential site for a stormwater BMP.

The riparian buffer is limited on the east bank by Canal Drive, and the existing sewer easement and Ripley Drive on the west bank. Existing roads and utilities are constraints to stream restoration, and to a lesser extent, stream stabilization. However, stream bank erosion may threaten the structural integrity of Canal Drive at some point in the future, dictating stabilization efforts. Buffer enhancement through the control of invasive species is possible throughout the reach.

The City of Wilson has identified a location, near the proposed parking lot, for a stormwater BMP. Approximately 18 acres in the 144 acre watershed for this point in the creek drain to the proposed BMP location. Using estimates from the N.C. Stormwater BMP Manual, a portion of the runoff from the 18 acres, to be determined by future design steps, can be treated, reducing suspended solids by 85%, and nitrogen (N) and phosphorus (P) by 40%.

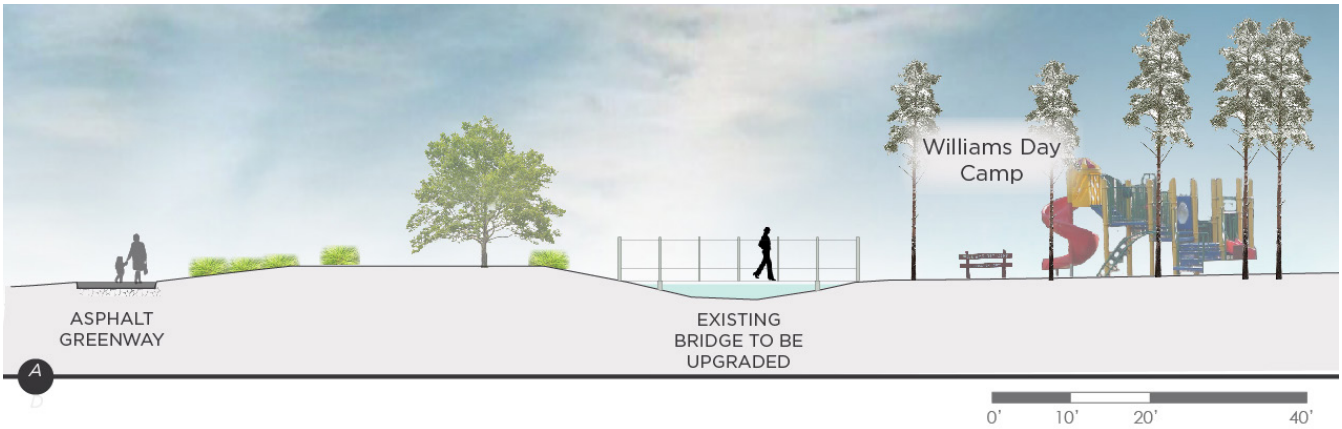
The City has also acquired 3 parcels along Canal Drive, between Pinewood Drive and Kincaid Avenue, where a BMP could be located. Approximately 143 acres drain to this point, approximately 18 acres in Section 1 and approximately 125 acres in Section 2. Based on potential future design, a BMP can treat a portion of the runoff from this 143 acre area, reducing suspended solids by 85%, and nitrogen (N) and phosphorus (P) by 40%.

COST CONSIDERATIONS:

Urban stream restoration **$300-$500/LF**

Riparian buffer restoration **$1.11/square foot**

Stormwater BMP's: **$5-$15/square foot**



SECTION 1: CONCEPT ENLARGEMENT MAP

SECTION 2: GREENWAY RECOMMENDATIONS

Section 2 starts at Kincaid Avenue and moves along the west side of Hominy Creek, passing through residential areas and connecting 6,984 people to destinations such as the Recreation Park and Community Center, Raleigh Rd Parkway and the convenience shops that line the street, and First Presbyterian Church. In order to strengthen these connections to destinations on the eastern side of the creek, two bridges are recommended to be upgraded. Intersection upgrades are also recommended to enable safe crossing of the street and to create better on road connections.

IMPACTS:

DEMOGRAPHICS

Overall Population: **6,984**

Households without Cars: **293**

Youth Under 18: **1,566**

Low-Income Households: **572**

Minorities:**2,776**

CONNECTIONS

Recreation Park and Community Center

Convenience Shops off of Raleigh Rd Parkway

First Presbyterian Church

COST CONSIDERATIONS:

Approximate Length: **0.6 miles**

3,089 feet Asphalt Greenway: **$200** per linear foot

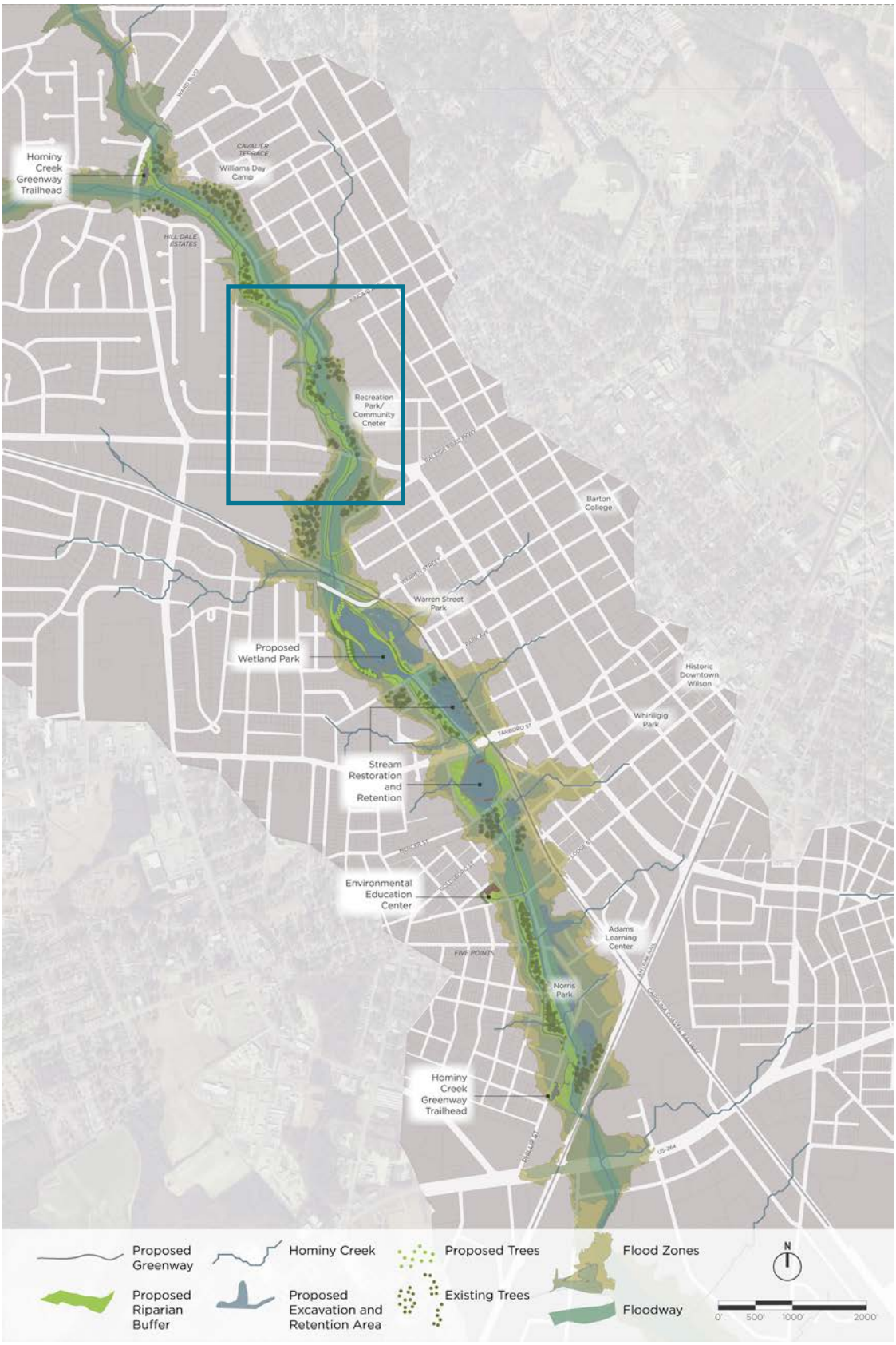
2 Pedestrian Bridge Upgrades: **$75,000** per bridge upgrade

2 at-grade intersection treatments: **$26,000** per intersection

Design & Engineering: **12%** of construction cost

2016 Budget Estimate : $850K - $930K

SECTION 2: OVERVIEW MAP



SECTION 2: WATER QUALITY RECOMMENDATIONS

Continuing along the sewer easement, the greenway approaches the first roadway intersection at-grade at Ripley Rd. where a high visibility crosswalk is proposed. The greenway extends along the west side of Hominy Creek, where a low water bridge is recommended at the tributary crossing. The greenway will spur to the Recreation Park/Community Center at the two existing bridge crossings. This area floods regularly and treatment areas are recommended between the creek and trail to retain stormwater. Where possible, existing vegetation will be retained.

Several options were studied for safely crossing Raleigh Rd. Because of the existing grades, an underpass is not recommended. And while not as desirable, the most visible and feasible location for the at-grade crossing is at the mid-block location just west of the Recreation Park entrance. High visibility crosswalk and a median refuge island is recommended for this higher volume roadway.

An alternative greenway route is proposed on the east side of Hominy Creek south of Raleigh Road Pkwy. An eastern route would require a culvert extension on the south side of Raleigh Rd. To avoid a culvert extension the trail would need to narrow to 8-feet to use the existing headwall to cross the creek. This would also avoid the need for an additional pedestrian bridge.

Stream and buffer restoration has already been performed on this reach. No stormwater BMP retrofit opportunities were identified in the field survey for this reach.

COST CONSIDERATIONS:

Urban stream restoration **$300-$500/LF**

Riparian buffer restoration **$1.11/square foot**

Stormwater BMP's: **$5-$15/square foot**

SECTION 2: CONCEPT ENLARGEMENT MAP

SECTION 3: GREENWAY RECOMMENDATIONS

In the event that the western alignment is pursued, a pedestrian bridge will be required to cross the creek to the east side of the creek to connect to the at-grade railroad crossing on Warren St. Crossing beneath the rail line is not feasible at the railroad bridge. There are conflicts with drainage, the creek, and existing railroad bridge abutments. The at-grade crossing also eliminates the need to coordinate a new crossing with the railroad. Once the trail is east-side, there are several privately owner residential lots that will require easements and discussions with property owners. Alternatively, if easements could be negotiated with the far reach of the railroad easement, that is also an option, however far less feasible.

A spur to the Westover neighborhood will connect residents to the greenway. In addition, an alternative on-road option is given if easements cannot be obtained along private property. Sharrows would provide a bicycle connection to Warren St., while pedestrians would walk along low-volume neighborhood roads within Westover. A sidewalk would be required along Warren St. until the greenway continues south.

IMPACTS:

DEMOGRAPHICS

Overall Population: **4,264**

Households without Cars: **377**

Youth Under 18: **1,021**

Low-Income Households: **694**

Minorities:**3,443**

CONNECTIONS

Warren Street Park

Westover Neighborhood

Barton College

COST CONSIDERATIONS:

Approximate Length: **0.8 miles**

4,373 feet Asphalt Greenway: **$200** per linear foot

1 50-foot Pedestrian Bridge: **$100,000**

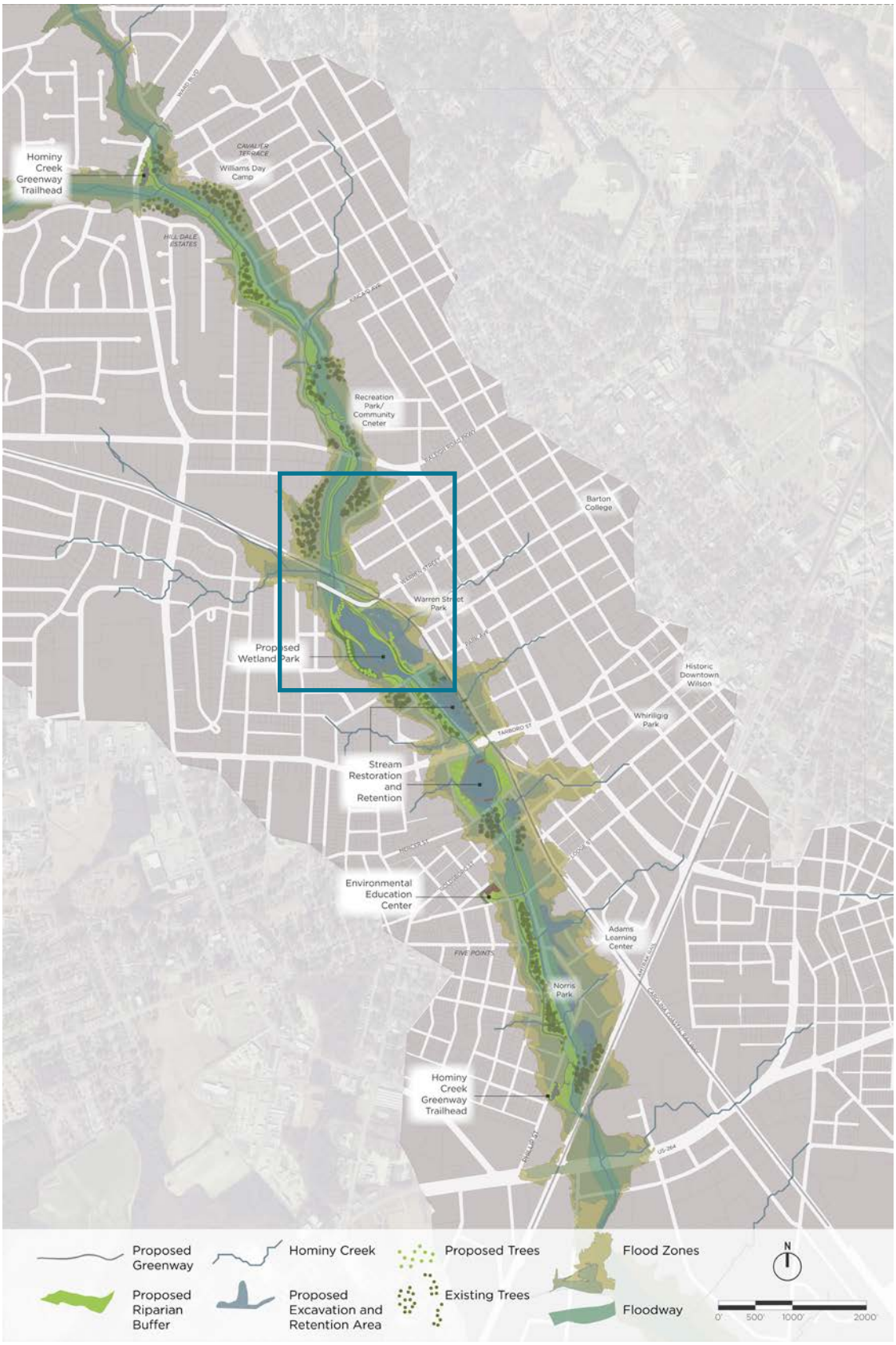
At grade intersection treatment: **$26,000** per intersection

Proposed Wetland Park:**$800K - $1M**

Design & Engineering: **12%** of construction cost

2016 Budget Estimate: $2.2M - $3M

SECTION 3: OVERVIEW MAP



SECTION 3: WATER QUALITY RECOMMENDATIONS

South of the railroad, from Elizabeth Rd. to Park Ave., the public property in this area is subject to frequent flooding. The City has plans to relocate the existing housing. If the housing is relocated the remaining land will become park space. This master plan builds on concepts the City has developed in this area for a large stormwater wetland BMP, stream and buffer restoration and a park with a looped trail system, educational signage, and boardwalk.

The creek channel is incised an average of approximately 9 feet throughout this section. The stormwater wetland BMP will require excavation down to the approximate elevation of the creek channel, and the creation of a low-elevation floodplain that storm flows can access during precipitation events. The floodplain will be separated from the stream channel by a levee, which captures higher stream flows for treatment in the created floodplain. Using this basic design concept, and the footprint shown in the Section 3 graphic, it is estimated that the BMP/park area is approximately 18 acres, with approximately 14 acres of area for floodwater storage and treatment. The storage and treatment volume is approximately 28 acre-feet, assuming an average depth of 2 feet of storage. The floodwater storage/treatment area proposed represents floodplain area that is not currently accessible. Using estimates from the N.C. Stormwater BMP Manual, a substantial portion of the runoff from the upstream watershed, to be determined by future design steps, can be treated, reducing suspended solids by 85%, and nitrogen (N) and phosphorus (P) by 40%.,

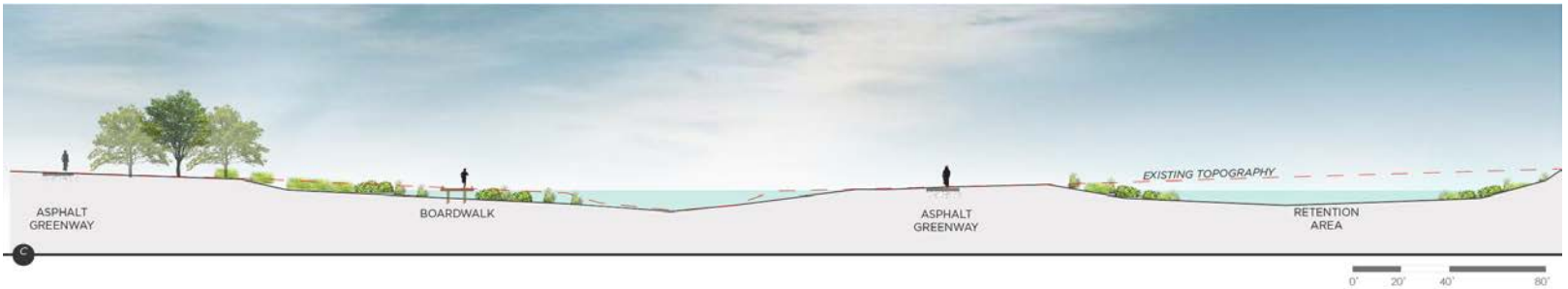
Stream and buffer restoration along the approximately 1,650 feet of stream in this section associated with this work would also contribute to the reduction in these pollutants. The proposed concept would remove 26 buildings from the 100 year floodplain, remove approximately 2.7 acres of impervious surface from the watershed, and reduce flooding frequency and severity. The proposed project will combine stormwater quality improvements, storm flow reduction, stream restoration, buffer restoration, greenways and recreational and educational opportunities through this section.

COST CONSIDERATIONS:

Urban stream restoration **$300-$500/LF**

Riparian buffer restoration **$1.11/square foot**

Stormwater BMP's: **$5-$15/square foot**



SECTION 3: CONCEPT ENLARGEMENT MAP

SECTION 4: GREENWAY RECOMMENDATIONS

At Park Ave., an at-grade crossing is proposed. The greenway is recommended to continue south on the west side of the creek along city-owned property, however an alternative should be explored in the event the city acquires the regularly flooded parcel on the east side of the creek between Beacon St. and the railroad. If the alternative is pursued, Beacon St. could be permanently closed and the adjacent space used for retention. A western alignment also provides more feasible routing beneath Tarboro St.. If property is not obtained at this location, a pedestrian bridge across the creek and extensive grading will be necessary north of Tarboro St.

Based on the on the infrequent use of the rail line and ample width of the easement, a rail-with-trail option should be considered to route users beneath Tarboro St. This eliminates the need to cross at-grade and mid-block at an otherwise very dangerous roadway. Discussions and negotiations with the railroad are recommended if this option is pursued.

The City owns property along the entire west bank and has identified the parcels along the east bank as potential acquisitions. If the properties on the east bank are acquired, the corridor will be sufficiently wide to restore the stream, create stormwater BMP's on either/both sides of the stream, and restore the riparian buffer on this reach. Should this property get turned over to the city, large stormwater BMP's could be incorporated beside the stream, with a meandering greenway. The existing access road at the north side of the property should be closed and retention areas maximized.

The greenway continues south with at-grade crossings proposed at Mercer St. and Goldsboro St. along public land. Alternatively, if the rail-with-trail option is accepted, the trail could extend within rail right-of-way until crossing Goldsboro St. The greenway would rejoin paralleling the creek to the south.

IMPACTS:

DEMOGRAPHICS

Overall Population: **12,386**

Households without Cars: **969**

Youth Under 18: **2,736**

Low-Income Households: **1,345**

Minorities: **7,777**

CONNECTIONS

Fleming Stadium

NC Baseball Museum

Historic Downtown Wilson

Whirligig Park

COST CONSIDERATIONS:

Approximate Length: **0.7 miles**

3,504 feet Asphalt Greenway: **$200** per linear foot

1 80-foot Pedestrian Bridge: **$200,000**

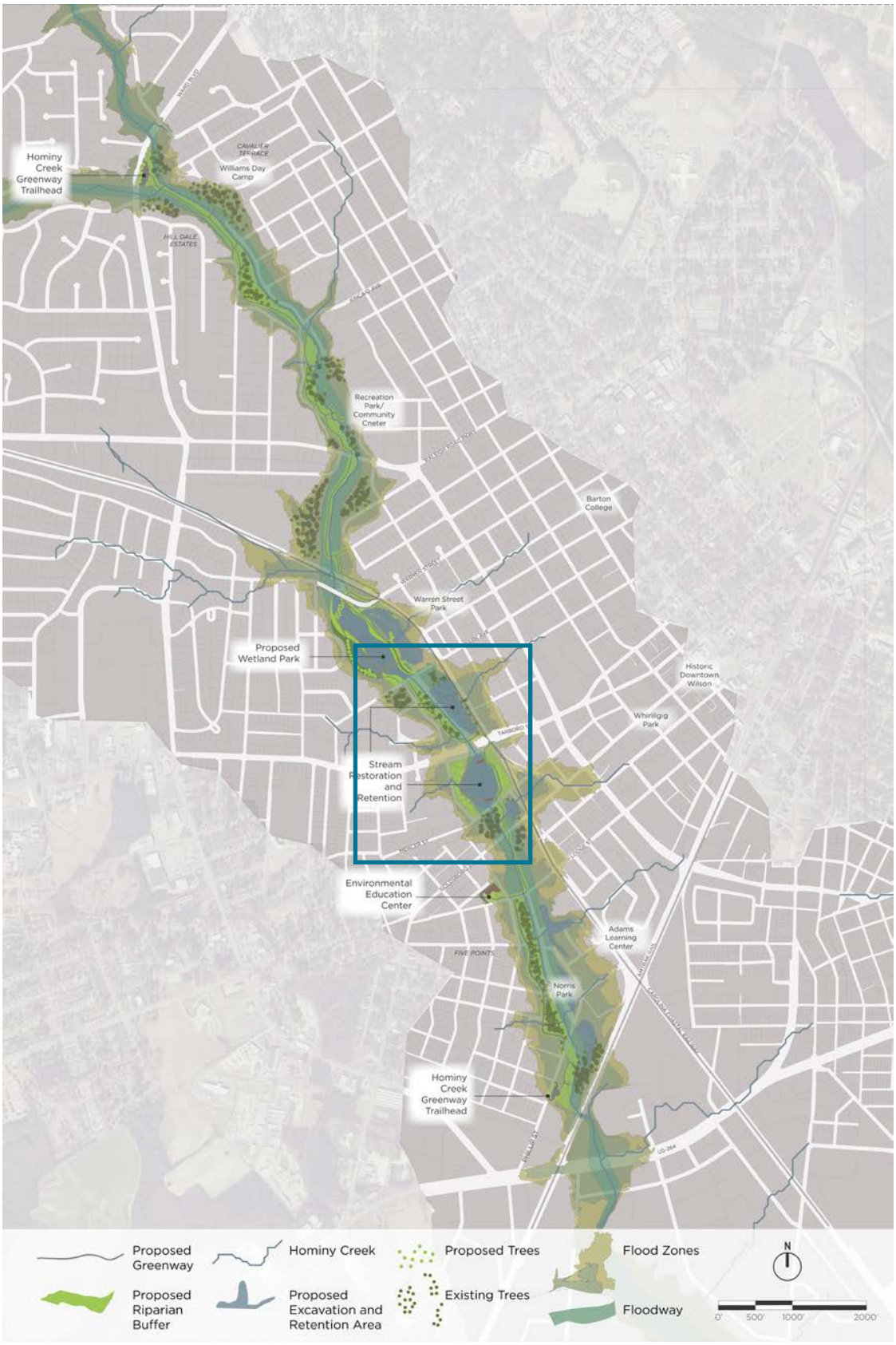
2 At-grade intersection treatments :**$26,000** per intersection

Proposed Wetland Park: **$975,000 - $1.2M**

Design & Engineering: **12%** of construction cost

2016 Budget Estimate: $2.2M - $3.5M

SECTION 4: OVERVIEW MAP



SECTION 4: WATER QUALITY RECOMMENDATIONS

The creek channel is incised approximately 8-12 feet throughout this section. Assuming property acquisitions, three stormwater BMP's are proposed between Park Avenue and Tarboro Street, Tarboro Street and Mercer Street and Mercer Street and Goldsboro Street. The stormwater wetland BMP's along the creek will require excavation down to the approximate elevation of the creek channel, and the creation of a low-elevation floodplain that storm flows can access during higher stream flow events. The floodplain will be separated from the stream channel by a levee, which captures higher flows for treatment in the created floodplain. Using this basic design concept, and the footprints shown in the Section 4 graphic, the following BMP attributes are estimated, in Table 3.2.

TABLE 3.2: SECTION FOUR BMP CALCULATIONS

Streets Bracketing BMP Location	BMP Total Area (ft^2/ac)	BMP Storage volume (ft^3)	BMP Storage (acre-feet)	Stream Restoration/ Stabilization (ft)
Park-Tarboro	125,915 / 2.9	149,330	3.4	1,250
Tarboro-Mercer	323,178 / 7.4	558,981	12.8	750
Mercer-Goldsboro	93,525 / 2.1	166,575	3.8	390
Total:	542,618 / 12.4	874,886	20	2,390

The proposed BMP's range in size from just over 2 acres to approximately 7.5 acres, and total approximately 12.4 acres. The storage and treatment volume is approximately 20 acre-feet, assuming an average depth of 2 feet of storage. Except for the Mercer-Goldsboro reach, the floodwater storage/ treatment area proposed represents floodplain area that is not currently accessible. Using estimates from the N.C. Stormwater BMP Manual, a substantial portion of the runoff from the upstream watershed, to be determined by future design steps, can be treated, reducing suspended solids by 85%, and nitrogen (N) and phosphorus (P) by 40%., Stream and buffer restoration along the approximately 2,400 feet of stream in this section would also contribute to the reduction in these pollutants.

The proposed concept would remove 6 buildings from the 100 year floodplain, remove approximately 11.5 acres of impervious surface from the watershed, helping to reduce flooding frequency and severity. Buffer enhancement by removal of invasive species is possible on this reach. The City owns property on the bank that is a proposed site for a stormwater BMP retrofit to treat flows originating in the downtown area.

COST CONSIDERATIONS:

Urban stream restoration **$300-$500/LF**

Riparian buffer restoration **$1.11/square foot**

Stormwater BMP's: **$5-$15/square foot**

SECTION 4: CONCEPT ENLARGEMENT MAP

SECTION 5: GREENWAY RECOMMENDATIONS

An environmental education center is proposed north of Lodge St. on one of the few properties along the corridor outside of the 100-year floodplain. This facility would connect to the greenway along Lodge St. South of Lodge, public housing in this area is subject to frequent flooding. The City has plans to relocate the existing housing. If the housing is relocated the remaining land will become park space and retention areas can be excavated for flood control. The greenway should extend to the west as much as possible to maximize storage and provide access to the Five Points neighborhood.

Because Norris Blvd. and Malpas Dr. are located in the 100-year floodplain and are not necessary for roadway circulation, they are recommended to be closed to maximize park space and retention opportunities. Access spurs will provide safe connections to adjacent residents if the east end of Aycock, Jordan, and Briggs St. become greenway access only. Stream restoration measures could also be pursued in this location to meander the creek and provide a more naturalized hydrology.

Under present conditions, stream restoration/ stabilization is limited by private ownership and lack of lateral space due to infrastructure, but buffer restoration/bank stabilization is feasible on the lower end of the reach if the land could be acquired.

The City has owns property on both sides of the stream, and has identified additional properties on this reach for acquisition in the future. The City has developed a concept to create a large-scale stormwater BMP retrofit/stream restoration/ buffer restoration/greenway complex on this reach.

IMPACTS:

DEMOGRAPHICS

Overall Population: **11,006**

Households without Cars: **717**

Youth Under 18: **2,479**

Low-Income Households: **998**

Minorities:**6,871**

CONNECTIONS

Norris Park

Adams Learning Center

Proposed Environmental Education Center

Five Points Neighborhood

COST CONSIDERATIONS:

Approximate Length: **0.5 miles**

2,640 feet Asphalt Greenway: **$200** per linear foot

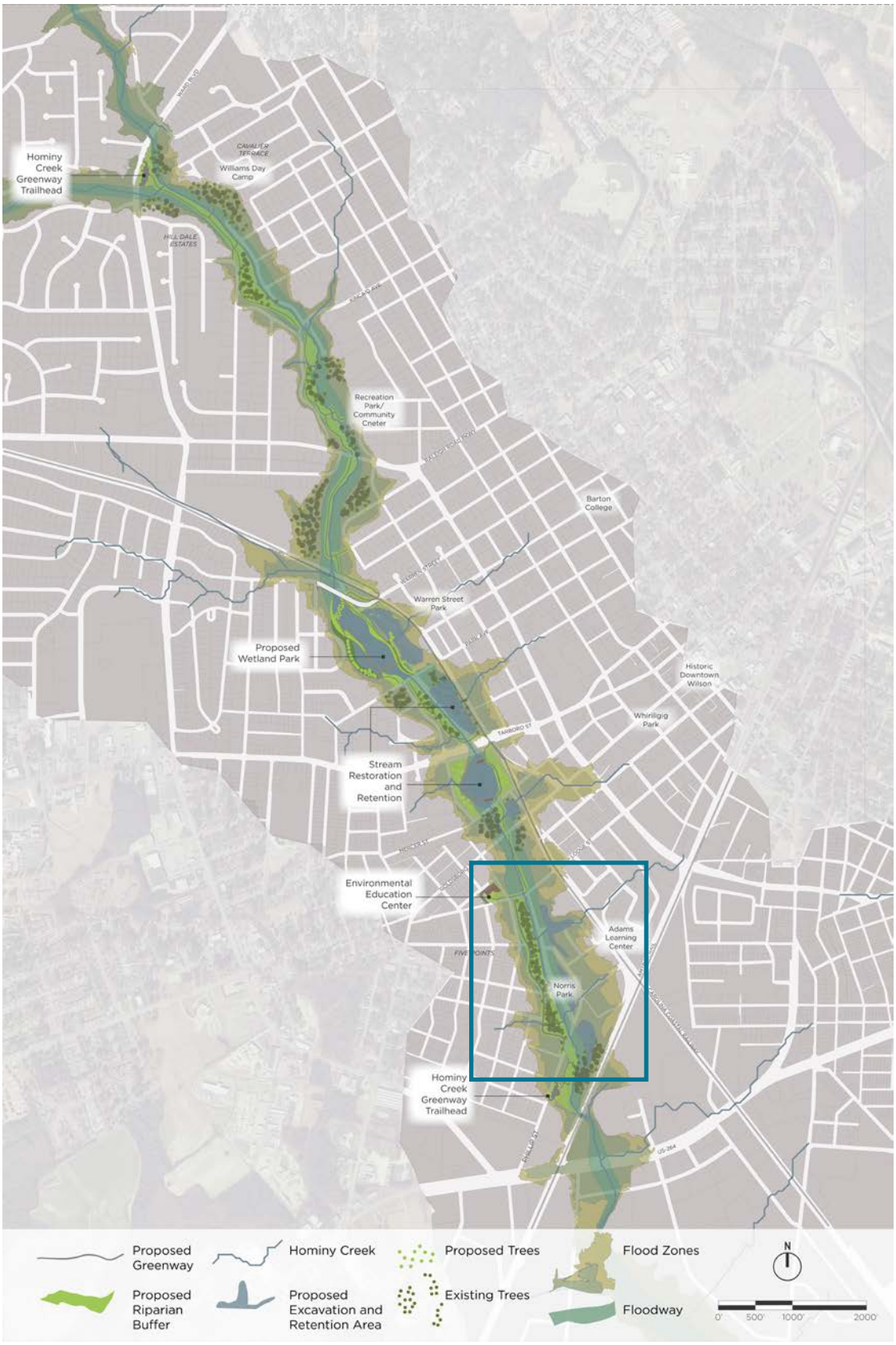
2 At-grade intersection treatments:**$26,000** per intersection

Proposed Stormwater Retention Area:**$300K - $350K**

Design & Engineering: **12%** of construction cost

2016 Budget Estimate: $1M - $1.2M

SECTION 5: OVERVIEW MAP



SECTION 5: WATER QUALITY RECOMMENDATIONS

The creek channel is incised approximately 8-12 feet throughout this section. Assuming property acquisitions, three stormwater BMP's are proposed between Lodge and Phillip Streets, at Norris Park, and at Ridgeway Park. The stormwater wetland BMP's along the creek will require excavation down to the approximate elevation of the creek channel, and the creation of a low-elevation floodplain that storm flows can access during precipitation events. The floodplain will be separated from the stream channel by a levee, which captures higher flows for treatment in the created floodplain. Using this basic design concept, and the footprints shown in the Section 4 graphic, the following BMP attributes are estimated, in Table 3.3.

TABLE 3.3: SECTION FIVE BMP CALCULATIONS

Streets Bracketing BMP Location	BMP Total Area (ft^2/ac)	BMP Storage volume (ft^3)	BMP Storage (acre-feet)	Stream Restoration/ Stabilization (ft)
Lodge-Phillip	283,315 / 6.5	460,415	10.6	730
Norris-Park	110,997 / 2.6	204,970	4.7	117
Ridgewood Park	128,814 / 3	257,628	5.9	
Total:	542,618 / 12.4	923,014	21	847

The proposed BMP's range in size from approximately 2.5 acres to approximately 6.5 acres, and total approximately 12 acres. The storage and treatment volume is approximately 21 acre-feet, assuming an average depth of 2 feet of storage. Using estimates from the N.C. Stormwater BMP Manual, a substantial portion of the runoff from the Section's watershed, to be determined by future design steps, can be treated, reducing suspended solids by 85%, and nitrogen (N) and phosphorus (P) by 40%., Stream and buffer restoration along the approximately 850 feet in this section would also contribute to the reduction in these pollutants.

The proposed concept would remove 35 buildings from the 100 year floodplain, remove approximately 5.7 acres of impervious surface from the watershed, helping to reduce flooding frequency and severity. A fraction of the proposed Ridgewood Park BMP extends into Section 6, however the BMP description is in Section 5.

COST CONSIDERATIONS:

Urban stream restoration **$300-$500/LF**

Riparian buffer restoration **$1.11/square foot**

Stormwater BMP's: **$5-$15/square foot**

SECTION 5: CONCEPT ENLARGEMENT MAP

SECTION 6: GREENWAY RECOMMENDATIONS

When the greenway reaches Philip St. an at-grade crossing is proposed to connect to Ridgewood Park. This attractive open are provides views of the creek. Overlooks with educational signage, a parking area, and open passive space make a nice southern terminus for the greenway. A pavilion or shade structure should be considered for user comfort.

The City owns property on the west bank of the reach, and has identified property for acquisition on the upstream east bank which would provide lateral space for a proposed stream restoration/ stabilization, buffer restoration, and stormwater BMP retrofit complex on this reach.

IMPACTS:

DEMOGRAPHICS

Overall Population: **2,884**

Households without Cars: **125**

Youth Under 18: **764**

Low-Income Households: **347**

Minorities:**347**

CONNECTIONS

Ridgewood Park

Putt-Putt Fun Center

Wilson Botanical Gardens

Retail along Ward Blvd.

COST CONSIDERATIONS:

Approximate Length: **0.2 miles**

1,096 feet Asphalt Greenway: **$200** per linear foot

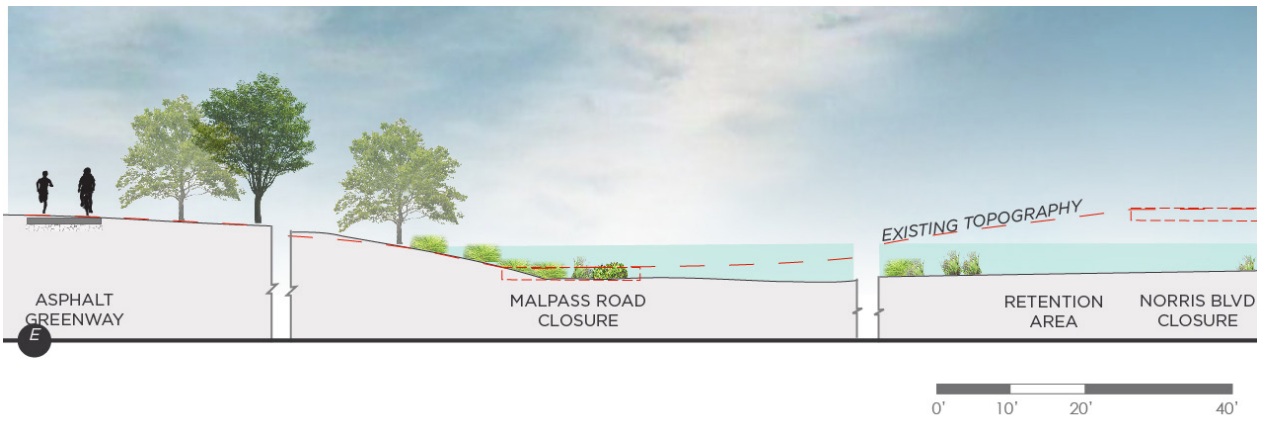
1 At grade intersection treatment :**$26,000** per intersection

1 Trailhead with 8 Parking Spaces:**$50,400**

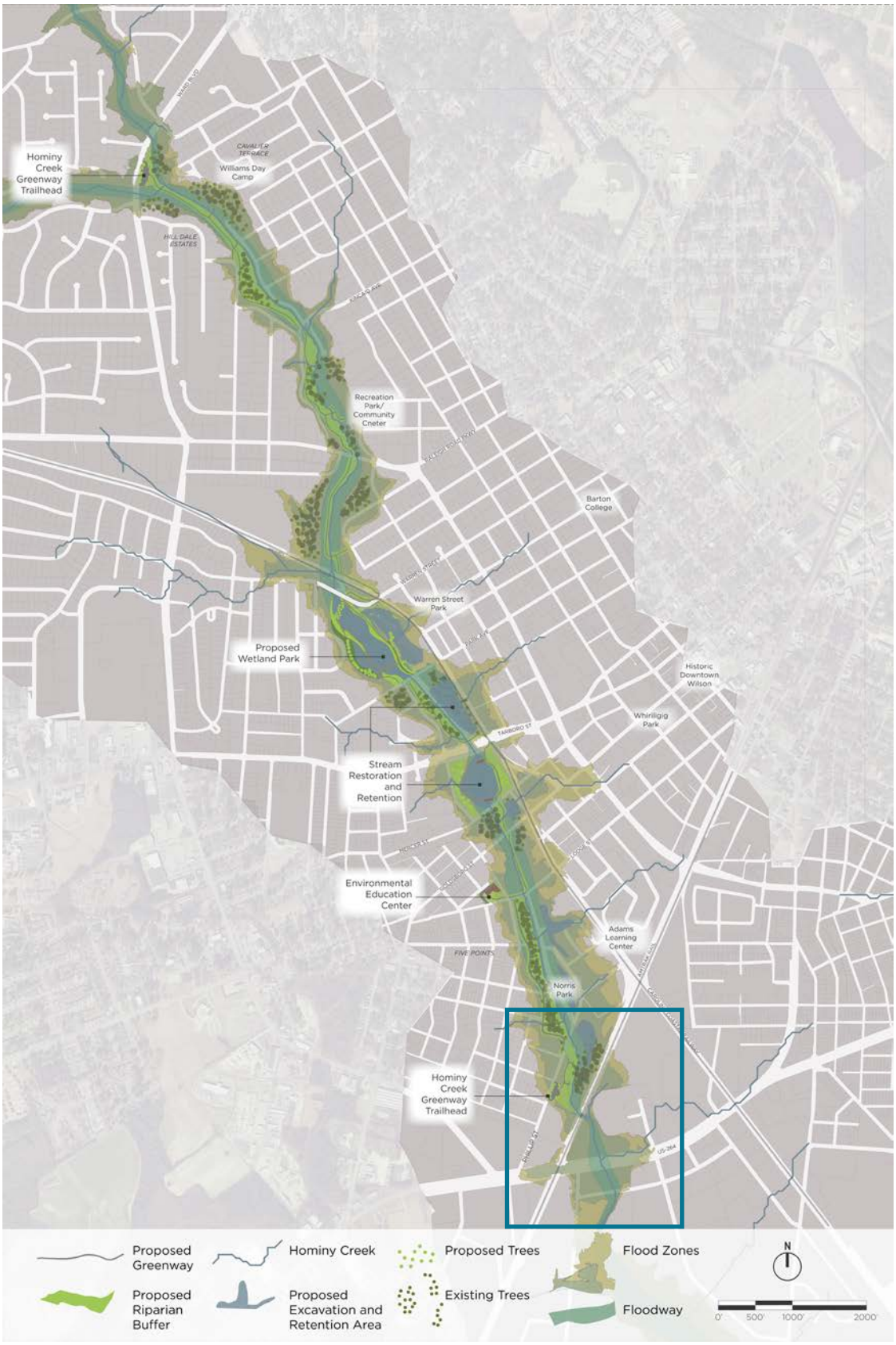
Open Space with 2 Overlooks: **$185K - $250K**

Design & Engineering: **12%** of construction cost

2016 Budget Estimate : $580K - $725K



SECTION 6: OVERVIEW MAP



SECTION 6: WATER QUALITY RECOMMENDATIONS

None for Section 6.

SECTION 6: CONCEPT ENLARGEMENT MAP

PHASING PLAN

This recommendations in this study consider the Hominy Creek Greenway and Water Quality Park as one complete, linear project with multiple access points and associated stormwater treatment facilities. While the desired outcomes and anticipated benefits of trail and stormwater development will not be fully realized until the project is complete, impacts can begin to be felt by the community as soon as construction commences even for portions of the project. While significant cost savings can be gained by designing, permitting, and constructing the project in as minimal sections as possible, funding and permitting limitations will very likely preclude stormwater and greenway facilities from being constructed as a unit project.

The Hominy Creek Greenway extends a total of 4.4 miles as recommended, including spurs and boardwalk splits. The phasing strategy proposed represents realistic goals for project implementation, assuming there is local support and cooperation.

Point-to-point connections were considered for all phases to avoid "dead-ends," as well as existing service areas and population density in Wilson. Also considered was overall connectivity, improved safety, public support, public lands, location upstream, and flood control needs. Those sections that fulfilled multiple criteria were given higher priority. The following map indicates a suggested phasing plan.

Phase 1: Hominy Creek Greenway from Ridgewood Park to Lodge St.

The first phase includes construction of the Hominy Creek Greenway, trailhead parking area, and two creek overlooks from Ridgewood Park north to Lodge St.

PHASING MAP


1.
9.
4.
3.
5.
6.
7.
2.
8.
1. PHASE 1: HOMINY CREEK GREENWAY AND TRAILHEAD CONSTRUCTION
2. PHASE 2: HOMINY CREEK GREENWAY AND TRAILHEAD CONSTRUCTION
3. PHASE 3: WETLAND PARK CONSTRUCTION
4. PHASE 4: BOARDWALK AND HOMINY CREEK GREENWAY CONSTRUCTION
5. PHASE 5: STORMWATER RETENTION EXCAVATION
6. PHASE 6: HOMINY CREEK GREENWAY CONSTRUCTION
7. PHASE 7: STORMWATER RETENTION EXCAVATION
8. PHASE 8: STORMWATER RETENTION EXCAVATION
9. PHASE 9: HOMINY CREEK GREENWAY CONSTRUCTION

Phase 2: Hominy Creek Greenway from Ward Ave. to Raleigh Road Pkwy.

Phase 2 includes construction of the Hominy Creek Greenway, trailhead parking area, trail connections to adjacent neighborhoods, the installation of a low water bridge/clear span bridge structure across a creek tributary, and the rehabilitation of two existing bicycle/pedestrian bridges.

Phase 3: Wetland Park Excavation

Phase 3 involves the relocation of public housing and subsequent demolition, the realignment of Warren Street, and retention pond excavation in preparation for the future wetland park.

Phase 4: Wetland Park Boardwalk, Trail, and Amenities

Once Phase 3 has been completed, Phase 4 work would begin and include the installation of boardwalk, the greenway, viewing platforms, educational signage, and landscape to complete the Wetland Park.

Phase 5: Stormwater Retention from Park Ave. to Tarboro St.

Phase 5 includes the closing and demolition of Beacon St., demolition of existing structures in the floodway, stream restoration, and excavation for stormwater retention ponds.

Phase 6: Hominy Creek Greenway from Lodge St. to Park Ave.

Once stormwater facilities are installed from Park Ave. to Tarboro St., greenway construction would complete the corridor for this section of Phase 6. All project finishing and trail amenities would be included in this phase.

Phase 7: Stormwater Retention from Tarboro St. to Goldsboro St.

Phase 7 would involve the demolition of existing buildings and roadways, and the uncapping of Hominy Creek. Stream restoration, excavation of stormwater retention areas, installation of boardwalk, and project phase finishing items would conclude this phase.

Phase 8: Stormwater Retention from Ridgewood Park to Lodge St.

Once the greenway is installed, stormwater BMP's would be constructed in this phase, including excavation for retention. Malpas Dr. and Norris Blvd. would be closed, as well as several streets near the storage buildings to accommodate the proposed retention areas.

Phase 9: Hominy Creek Greenway from Raleigh Road Pkwy. to Warren St.

Phase 9 will require the acquisition of several trail easements from private properties. Because there are several alternatives for this phase it is recommended that this section be completed at the end of the project. This phase includes the construction of the greenway, coordination with the railroad for an at-grade crossing, and installation of a bicycle/pedestrian bridge across Hominy Creek.

Potential Greenway Benefits

Trails Generate Economic Activity and Benefit Local Businesses

Tourism is a major economic driver for North Carolina. The 6th most visited state in the United States, **visitors spend as much as $18 billion a year,** many of whom partake in activities related to walking, hiking, or biking.[1] Cities and towns receive an economic boost from visitors each year. In North Carolina's Outer Banks alone, the attraction of **bicycling on vacation is estimated to have an annual economic impact of $60 million and support 1,407 jobs.**[2] The annual return to local businesses and state and local governments on bicycle facility development in the Outer Banks is approximately **nine times higher than the initial investment.**[2]

Trails Increase Real Property Values

Greenway trails are popular community amenities that **add value to properties nearby.** According to a 2002 survey by the National Association of Realtors and the National Association of Homebuilders, homebuyers rank **trails as the second-most important community amenity** out of 18 choices, above golf courses, ball fields, parks, security, and others.[3] This preference for trails is reflected in property values around the country:

- The report, "Walking the Walk: How Walkability Raises Housing Values in U.S. Cities", analyzed data from 94,000 real estate transactions in 15 major markets provided by ZipRealty and found that in **13 of the 15 markets, higher levels of walkability, as measured by Walk Score, were directly linked to higher home values.**[4]
- In the Shepard's Vineyard residential development in Apex, North Carolina, **homes along the regional greenway were priced $5,000 higher** than other residences in the development – and these homes were still the first to sell.[5]
- A study of home values along the Little Miami Scenic Trail in Ohio found that **single-family home values increased by $7.05 for every foot closer a home is to the trail.**[6]

These higher prices reflect how trails and greenways add to the desirability of a community, attracting homebuyers and visitors alike.

Trails Offer Transportation Cost Savings

When looking at the returns on investment noted above, it is also important to put into perspective the massive differences in costs inherent in the transportation decisions we make, both as individuals and as a community. Consider the individual costs associated with different forms of transportation: **Walking is virtually free, while the average annual cost of operating a bicycle is $308.**[7] Compare these to the average annual operating cost for a car, which the American Automobile Association reports as $8,876 for financing, insurance, gas, maintenance and repairs, registration, taxes, and depreciation.[8]

On a community scale, consider the high cost of our transportation infrastructure investments. According to the Federal Highway Administration, the cost of a single mile of urban, four-lane highway is between $20 and $80 million.[9] By contrast, a mile of greenway trail ranges from $500,000 to rarely more than $1 million, depending on construction materials, design, and local circumstances. **Bicycling and walking are affordable forms of transportation, and trails provide a low cost, high return option for transportation investments.**

Trails Improve Bicycle and Pedestrian Transportation Options

According to the 2011 Bicycle and Pedestrian Safety Survey, **at least 70 percent of North Carolinians would walk or bike more for daily trips if walking and bicycling conditions were improved.**[10] Moreover, a national transportation poll found that Americans **would like to see 22 percent of transportation funding invested in walking and bicycling facilities,** but current budget allocation sets aside only one percent of all transportation funding to walking and bicycling.[11] With improved accommodations, walking and bicycling can provide alternatives to driving for commuting to work, running errands, or making other short trips.

More than one quarter of all trips (commute and non-commute) taken by Americans each and every day are less than one mile, equivalent to a walking trip of 15 minutes or a 6-minute bike ride; however, just 13 percent of all trips are made by walking or bicycling nationwide.[12] To put these numbers into perspective, 34 percent of all trips are made by walking or bicycling in Denmark and Germany, and 51 percent of all trips in the Netherlands are by foot or by bike.[13] Germany, Denmark, and the Netherlands are wealthy countries with high rates of automobile ownership, just like the United States. Yet an emphasis has been placed on providing quality walking and bicycling environments, which has alleviated the reliance on motor vehicles for short trips.

Trails Improve Access to Destinations

Many North Carolinians do not have access to a vehicle or are unable to drive. According to US Census 5-Year (2008-2012) American Community Survey estimates, 6.5 percent of North Carolina households do not have access to an automobile.[14] A well-connected trail throughout Wilson would **provide safe, low-cost, convenient transportation options for those who are unable to drive or would prefer to not drive, and would help to minimize the disadvantage of not having access to a motor vehicle.** These improvements can increase access to important destinations for the young, the elderly, low-income families, and others who would otherwise have limited and less convenient travel options.

Trails Improve Health through Active Living

The Hominy Creek Greenway would **contribute to the overall health of residents** by offering people attractive, safe, and accessible places to

bike, walk, hike, jog, skate, and socialize. In short, **trails improve opportunities for active lifestyles.** The design of our communities today -- including our towns, subdivisions, transportation systems, parks, trails, and other facilities -- affect our ability to be active in communities. **The Centers for Disease Control and Prevention (CDC) recommend at least 30 minutes of moderate physical activity each day for adults, and 60 minutes per day for youth,** but many people are unable to reach these targets due to a lack of opportunities for physical activity. According to the CDC, "Physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic."[16]

The CDC determined that creating and improving places in our communities to create more physically active opportunities could generate as much as a **25 percent increase in the percentage of people who exercise at least three times per week.**[17] This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. A December 2010 article published by the Mayo Clinic reported that:

"Walking, like other exercise, can help you achieve a number of important health benefits such as:

- Lowered low-density lipoprotein (LDL) cholesterol (the "bad" cholesterol),
- Elevated high-density lipoprotein (HDL) cholesterol (the "good" cholesterol),
- Lowered blood pressure,
- Reduced risk of or managed Type 2 diabetes,
- Improved mood, and
- Increased feelings of strength and fitness."[18]

A separate study found that these personal health benefits also translate into health cost savings. **Every one dollar invested in pedestrian and bicycle trails saves as much as three dollars in direct medical expenses** due to the positive health effects of increased physical activity.[19]

Many public health agencies are teaming up with foundations, universities, and private companies to launch a new kind of health campaign that focuses on improving healthy lifestyle options. The National Let's Move! Campaign, Eat Smart Move More NC, and similar campaigns are examples of **promoting physical activity to help improve individual and community health.** The Rails-

to-Trails Conservancy puts it simply: "Individuals must choose to exercise, but communities can make that choice easier."[20]

Trails Support Environmental Stewardship

Trails, greenways, and open spaces provide a multitude of environmental benefits by preserving the natural functions of ecosystems. Greenways serve as buffers in developed areas that **protect and link fragmented habitats** and provide opportunities for protecting native plant and animal species. This buffer also helps to **improve water quality** by providing a natural filter for pollutants generated by agricultural and road runoff, keeping them out of local streams, rivers, and lakes.

Trails and greenways also **reduce air pollution** by two significant means. First, they provide enjoyable and safe transportation alternatives to the automobile, which can help to reduce the burning of fossil fuels and local pollution. Second, they provide large swaths of green space where plants can create oxygen and filter out air pollutants, such as ozone, sulfur dioxide, carbon monoxide, and airborne particles of heavy metal.

Greenways can also serve as an **educational tool,** providing opportunities for trail users to learn about the local landscape and environment. Interpretive signage along the trail could be designed to inform trail users about local wildlife, habitats, water quality issues, and other environmental education topics. Similarly, **greenways can serve as hands-on environmental classrooms** for people of all ages to experience natural landscapes, conduct creek clean-ups, and raise environmental awareness.

CONCLUSION

The Hominy Creek Greenway and Water Quality Park has the opportunity to transform into a public amenity that will increase adjacent property values, fulfill a need for outdoor recreation opportunities, offer a safe route for bicycle commuting as an alternate to driving, revitalize neighborhoods, and improve the overall quality of life in Wilson. The water quality improvements will reduce flooding, improve water quality using best management practices, and provide environmental education and stewardship while rehabilitating wildlife habitat.

A summary of project investment costs and associated benefits are listed below. This information provides guidance that will lead to the next steps of design and construction. The recommendations included in this master plan should not be substituted for a more thorough engineering analysis, which is necessary for both greenway and water quality .

Water Quality Recommendations Summary Information

Table 3.4 summarizes the attributes of the BMPs and stream restoration/stabilization proposed in Sections 3-5. It does not contain information on the 3 BMP's proposed in Section 1, which are smaller and were not developed to the level of detail as those in Sections 3-5, per the scope of this master planning effort. However, the proposed benefit of the BMP's in Section 1 should not be overlooked.

In total, the water quality concepts presented in this plan describe a potential for approximately 42 acres of stormwater BMP's (not including potential BMP's in Section 1), that would retain and treat approximately 70 acre-feet of stormwater. In addition, there are stormwater quality and quantity benefits available from the restoration/ stabilization of any of the approximately 4,900 feet of stream deemed feasible for that work within the project boundaries.

TABLE 3.4: TOTAL BMP CALCULATIONS

Streets Bracketing BMP Location	BMP Total Area (ft^2/ac)	BMP Storage volume (ft^3)	BMP Storage (acre-feet)	Stream Restoration/ Stabilization (ft)
Park-Tarboro	125,915 / 2.9	149,330	3.4	1,250
Tarboro-Mercer	323,178 / 7.4	558,981	12.8	750
Mercer-Goldsboro	93,525 / 2.1	166,575	3.8	390
Lodge-Phillip	283,315 / 6.5	460,415	10.6	730
Norris-Park	110,997 / 2.6	204,970	4.7	117
Ridgewood Park	128,814 / 3	257,628	5.9	
Total:	1,834,918 / 42	3,016,881	69	4,887

Greenway Recommendations Summary Information

Table 3.5 summarizes the total anticipated greenway impacts from all sections as well as the aggregate greenway development cost items. Because water quality recommendations (retention areas, stream restoration, and buffer restoration) are so difficult to estimate, those were not included in the budget estimates.

TABLE 3.5: TOTAL GREENWAY IMPACTS & BUDGET ESTIMATE

Total Population	Household without Cars	Youth under 18	Low-Income Households	Minorities
19,028	1,114	4,366	1,769	10,546

Unit	Unit Cost AVG.	Budget Estimate
17,544 feet of asphalt greenway	$200	$3,000,000-$4,000,000
5 bridge upgrades	$75,000	$300,000-$400,000
2 bridges	$150,000	$300,000-$350,000
2 trailheads	$60,000	$100,000-$200,000
8 at-grade intersection treatments	$26,000	$200,000-$300,000
2 wetland parks	$900,000	$1,800,000-$2,000,000
2 storm water BMP's	$300,000	$600,000-$800,000
Design and engineering cost	20%	$1,240,000-$1,600,000
Subtotal Budget Estimate:		$7,500,000- $9,600,000
CONTINGENCY	10%	$750,000 - $960,000
TOTAL 2016 BUDGET ESTIMATE		$8,250,000 - $10,560,000

References

1. The North Carolina Department of Commerce reported 37 million visitors to the state in 2011, of which 63 percent came from outside the state.
2. Institute for Transportation Research and Education, North Carolina State University. (2004). Pathways to Prosperity: The Economic Impact of Investments in Bicycle Facilities - A Case Study of the North Carolina Northern Outer Banks.
3. National Association of Homebuilders. (2008). www.nahb.com
4. Joe Cortright, Impresa, Inc. (2009). Walking the Walk: How Walkability Raises Home Values in U.S. Cities. Produced for CEOs for Cities.
5. Rails to Trails Conservancy. (2005). Economic benefits of trails and greenways.
6. Rails to Trails Conservancy. (2005). Economic Benefits of Trails and Greenways.
7. Sierra Club. (2012). Pedaling to Prosperity: Bicycling Will Save Americans $4.6 Billion in 2012. http://vault.sierraclub.org/pressroom/downloads/BikeMonth_Factsheet_0512.pdf
8. American Automobile Association. (2014). Your Driving Costs: How Much are You Really Paying to Drive? 2014 Edition.
9. Gotschi, T. & Mills, K. (2008). Active transportation for America: The case for increased federal investment in bicycling and walking. Rails to Trails Conservancy http://www.railstotrails.org/atfa.
10. Institute for Transportation Research and Education (ITRE) at North Carolina State University. (2011). Bicycle and Pedestrian Safety Survey.
11. Rails to Trails Conservancy. (2008). Active Transportation for America.
12. U.S. Department of Transportation and Federal Highway Administration. (2009). National Household Travel Survey.
13. Pucher, J., & Dijkstra, L. (2003). Promoting safe walking and cycling to improve public health: Lessons from The Netherlands and Germany. American Journal of Public Health, 93(9): 1509-1516.
14. US Census. American Community Survey 2008-2012 5-Year Estimates.
15. US Census. American Community Survey 2008-2012 5-Year Estimates.
16. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. (1996). Physical Activity and Health: A Report of the Surgeon General.
17. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). Guide to Community Preventive Services.
18. National Prevention Council. (2011). National Prevention Strategy: America's plan for better health and wellness. Retrieved from http://www.healthcare.gov/prevention/nphpphc/strategy/report.pdf
19. Wang, G, CA Macera, B Scudder-Soucie, T Schmid, M Pratt, D Buchner. (2005). A Cost-Benefit Analysis of Physical Activity Using Bike/Pedestrian Trails. Health Promotion Practice 6: 174.
20. Rails-to-Trails Conservancy. (2006) Health and Wellness Benefits.