NORTH OCONEE RIVER GREENWAY NETWORK PLAN

by

CHARLES RAPP

(Under the Direction of

Jack Crowley)

ABSTRACT

This study examines two proposed sections of the North Oconee River Greenway Network, the Horseshoe Bend Connector and the Botanical Gardens Connector, identifying funding opportunities to implement the project and potential constraints. The Horseshoe Bend Connector could use the creation of a Tax Allocation District in combination with selling or leasing excess land to promote development adjacent to the greenway and provide the necessary funding to construct the path. Athens-Clarke County could then partner with the University of Georgia utilizing the proposed site for future expansion of the College of Veterinary Medicine to reconnect to the North Oconee River. This study provides the Greenway Commission as well as the Athens-Clarke County Unified Government a detailed plan that can be used toward future decisions regarding these portions of the North Oconee River Greenway Network.

INDEX WORDS: Greenway, Trail, Path, North Oconee River Greenway Network, Tax Allocation District, Bike Lane, Sidewalk, Implementation

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CHARLES RAPP

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CHARLES RAPP

Major Professor:	Jack Crowley
Committee:	Jack Crowley David Spooner Carol Couch Melinda Cochran

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
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TABLE OF CONTENTS

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

The North Oconee River runs through the heart of Athens, GA providing an opportunity to protect the ecological integrity of the river system through the implementation of a greenway network. Greenway networks also help to connect neighborhoods, provide outdoor recreation and options for alternative transportation to local residents. Several years ago, the local government in Athens implemented the first segments of the Oconee River Greenway east and north of the downtown. The Unified Government of Athens-Clarke County adopted the Greenway Network Plan in June of 2003. As stated in the Greenway Network Plan, "the mission of the Athens-Clarke County Greenways is to identify, protect, and create a series of corridors that provide opportunities for conservation, preservation, education, transportation, and recreation (Department of Leisure Services Natural Resource Division, 2003)."

The Natural Resources Division of Athens-Clarke County has identified four major goals of the North Oconee River Greenway. The first goal is conservation and protection, providing a natural buffer system that enhances the quality of life through the conservation and preservation of natural life support systems. The second goal is to provide corridors and facilities that promote the use of non-motorized transportation. The greenway could then be incorporated into the existing transportation network of bike lanes, bus lines, and sidewalks. The third goal of the Greenway Network Plan addresses the need to educate the public. The goal is to "provide opportunities for both

self-guided and interpretive programs leading to a greater understanding of the natural environment, cultural heritage, and preservation/conservation efforts." The final goal of the plan is to provide recreation and an opportunity to experience nature (Department of Leisure Services Natural Resource Division, 2003).

The network plan identified three path and trail prototypes to guide the design of the greenway. The first is a 3'-6" wide "trail" made of natural materials and intended for light use (Department of Leisure Services Natural Resource Division, 2003). Although this type of trail may not always meet ADA standards, it is ideal for sensitive ecological areas. The second type of trail identified is a path intended for high use and constructed of crushed stone, concrete, or asphalt. The design guidelines follow the Georgia Department of Transportation standards and recommend a 10' minimum width and 9' clear cut vertical distance. The final prototype addresses areas of the greenway which may be inundated with water. Boardwalks are to be constructed of wood with a 14' minimum width for bicycle and pedestrian use (Department of Leisure Services Natural Resource Division, 2003). The majority of the greenway installed to date has been a 10' paved concrete path.

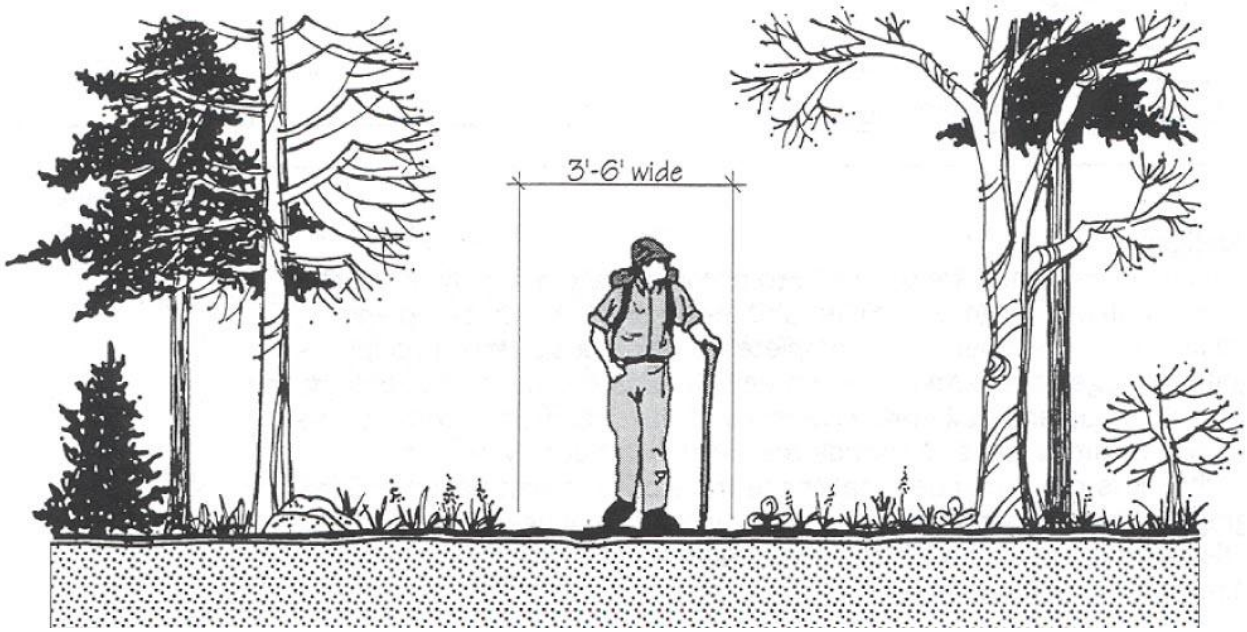


Figure 1 Trail Section (Department of Leisure Services Natural Resource Division, 2003).

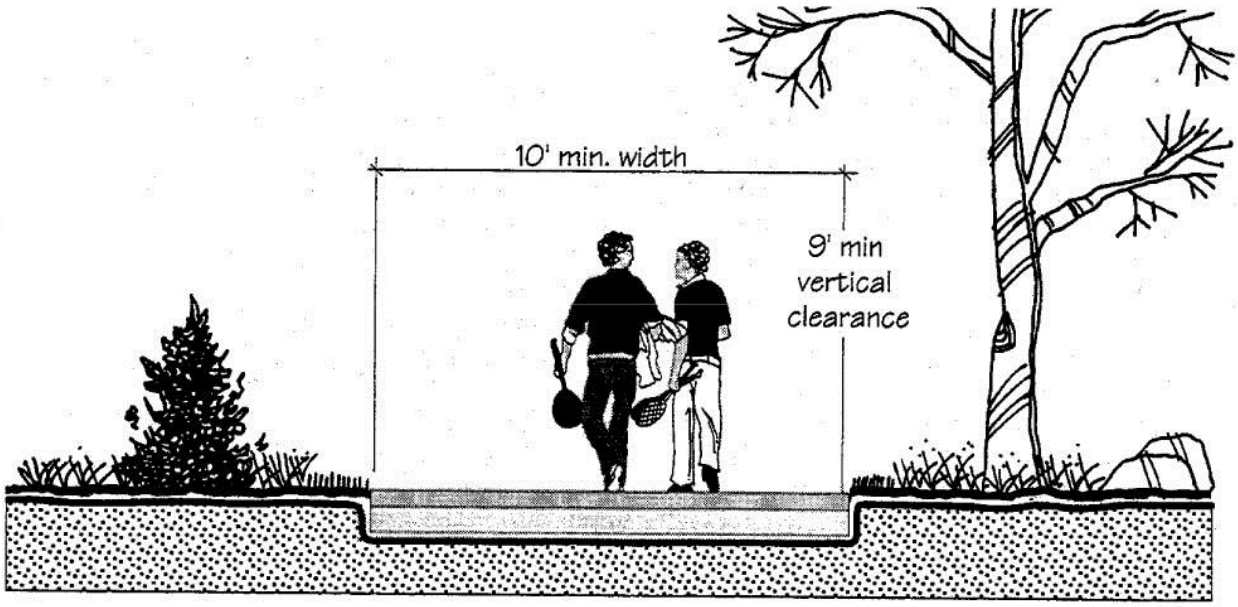


Figure 2 Path Section (Department of Leisure Services Natural Resource Division, 2003).

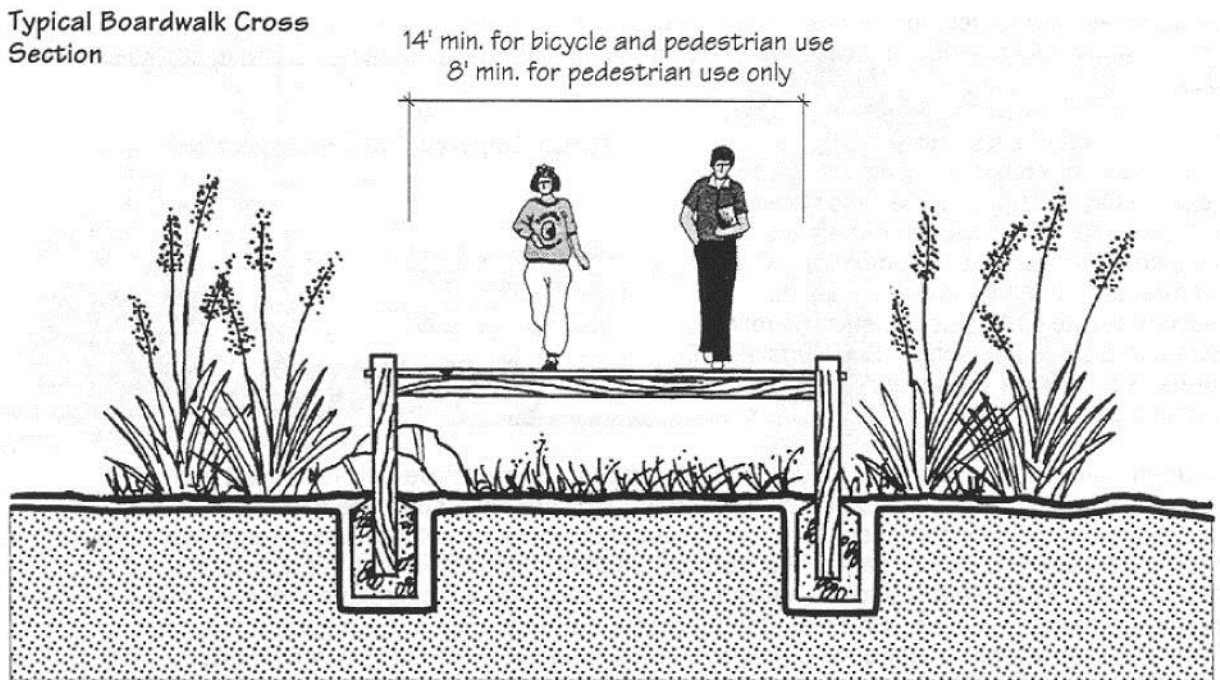


Figure 3 Boardwalk Section (Department of Leisure Services Natural Resource Division, 2003).

The first phase of the trail begins at Sandy Creek Park and continues south along the river ending north of downtown Athens. Cooks trail is a single track 4.1 mile trail linking Sandy Creek Park to the Sandy Creek Nature Center and connects to the North Oconee River Greenway. East Athens Community Park also connects to the greenway through the use of a secondary trail. The community investment to date is shown on the first map on the following page. The Greenway is planned to continue south along the river through the University of Georgia campus to the new waste water treatment facility located off of College Station Road (Athens-Clarke County Unified Government, 2010). The proposed route will eventually follow along the river until reaching the Botanical Gardens as shown on the map located on page 6.

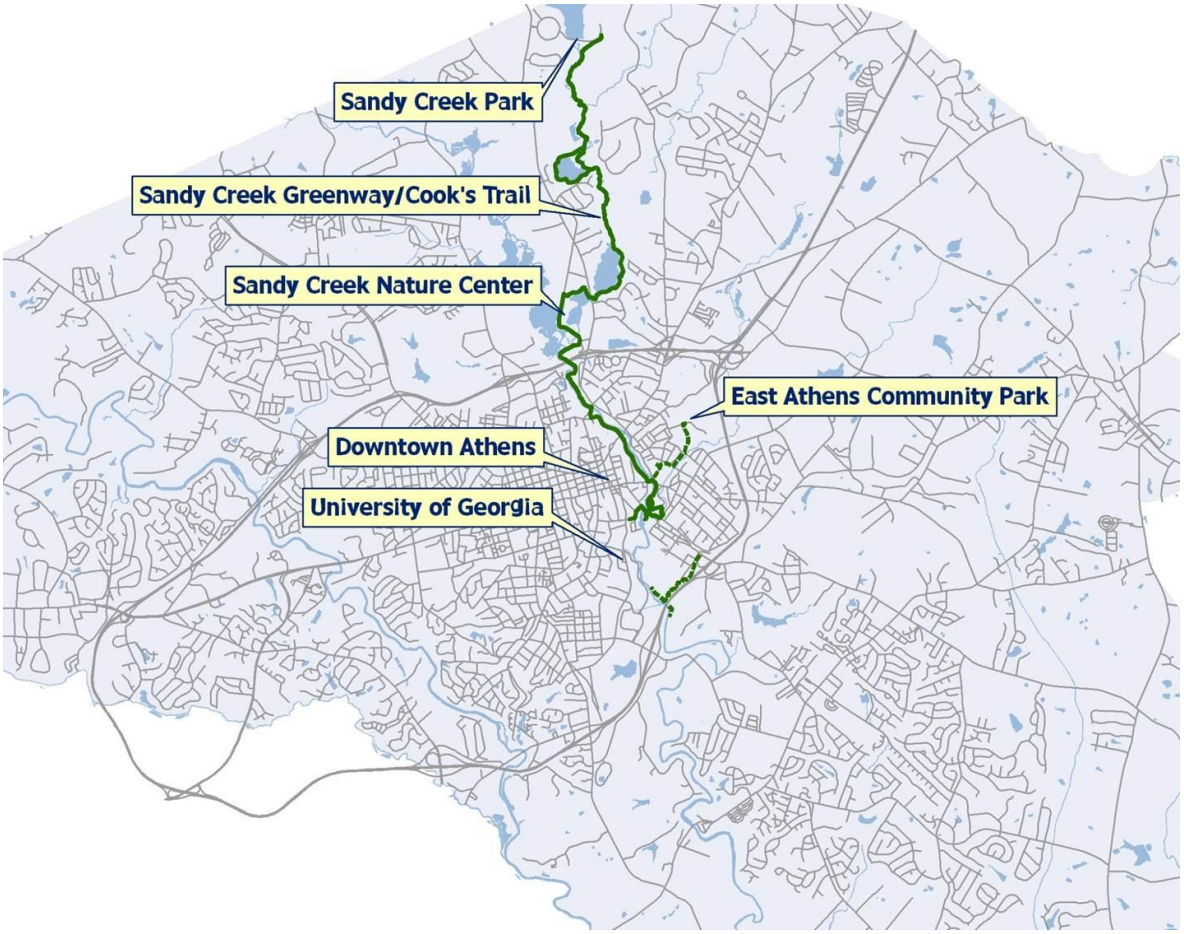


Figure 4 Constructed Greenway to Date, (Athens-Clarke County Unified Government, 2010).

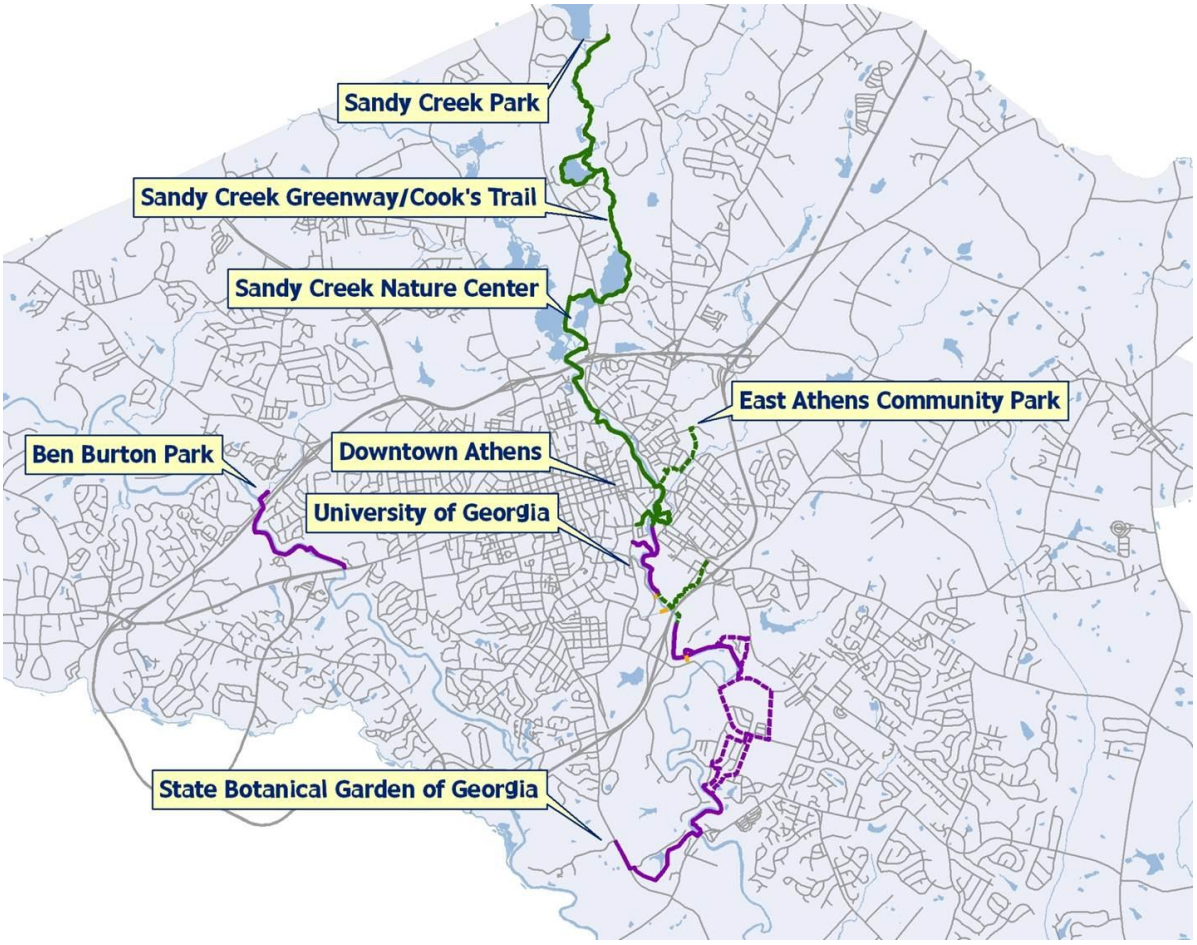


Figure 5 Existing and Proposed Greenway Plans (Athens-Clarke County Unified Government, 2010).

As identified in the 2011 SPLOST presentation, the Oconee River Greenway has a total of 5 subprojects proposed to continue the network south along the river through Athens. The five proposed subprojects include the Easley Mill Connector, the College Station Connector, the Horseshoe Bend Connector, the Botanical Garden Connector and the Middle Oconee River Greenway. The proposed sections total over 8.7 miles and require just over 19 million dollars in funding for implementation and

maintenance (Athens-Clarke County Unified Government, 2010). The following map shows the 5 proposed sub projects.

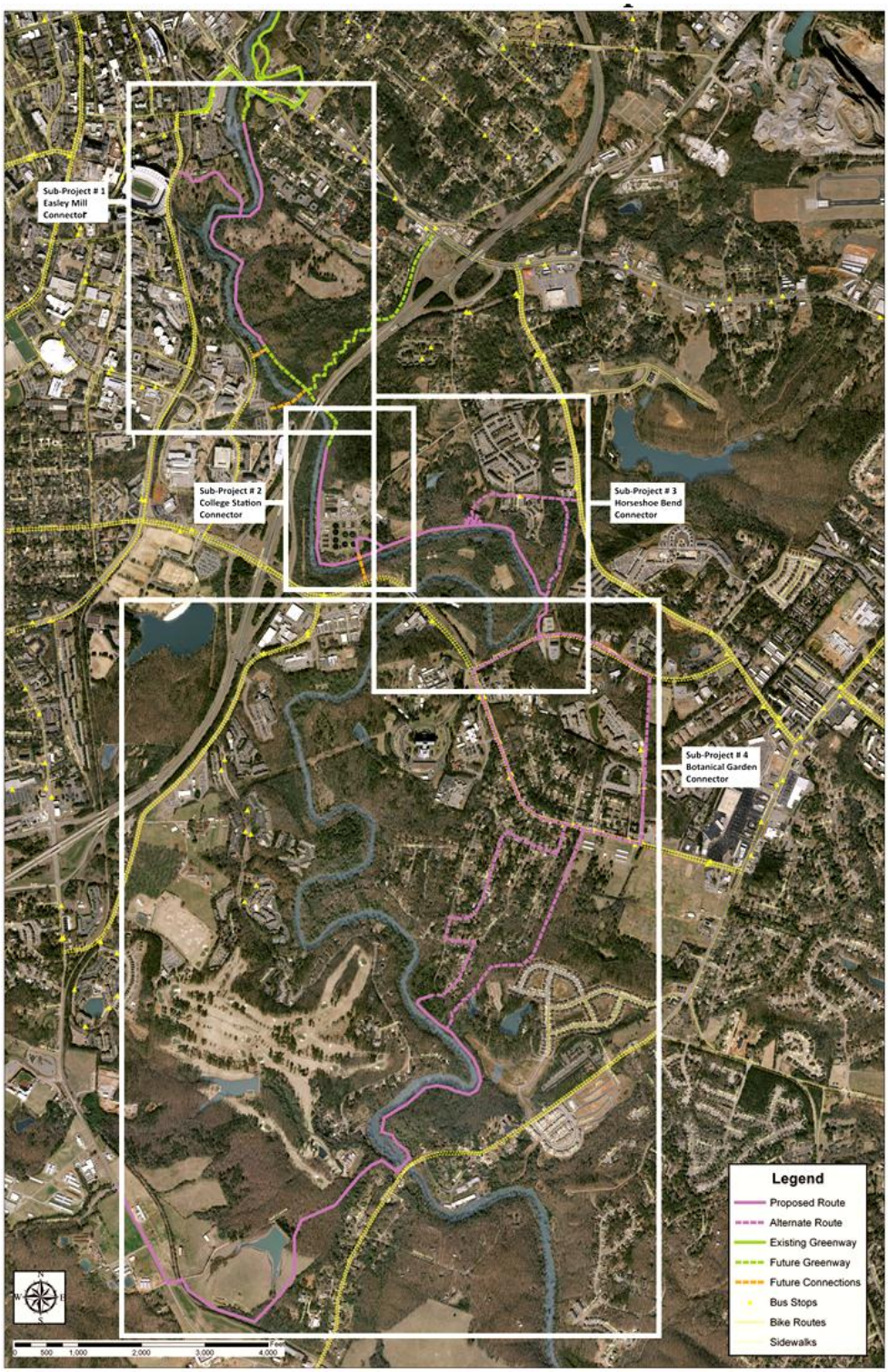
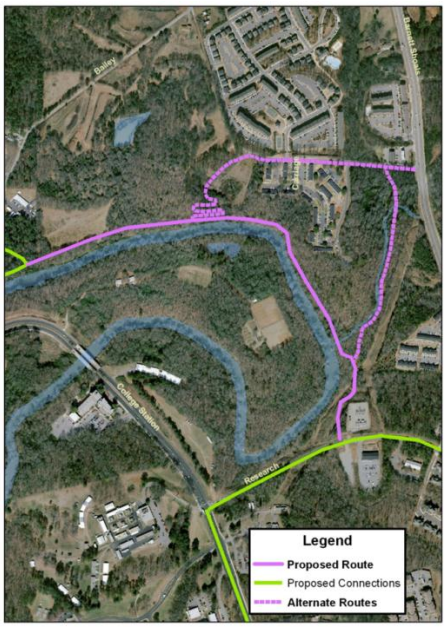


Figure 6 Proposed Sub Projects (Athens-Clarke County Unified Government, 2010).

CHAPTER 2

SCOPE OF PLAN AND PHASING

The sub projects for the Easley Mill Connector and the College Station Connector have been approved and are ready for construction. The two sections will essentially bring the constructed greenway to the new waste water treatment facility currently under construction off of College Station Road. The next proposed sections are the Horseshoe Bend Connector which will allow the greenway to follow the river towards Research Drive and the Botanical Gardens Connector which will eventually connect the greenway to the state botanical gardens off of South Milledge Avenue. The preliminary routes for each segment are shown in the maps below.



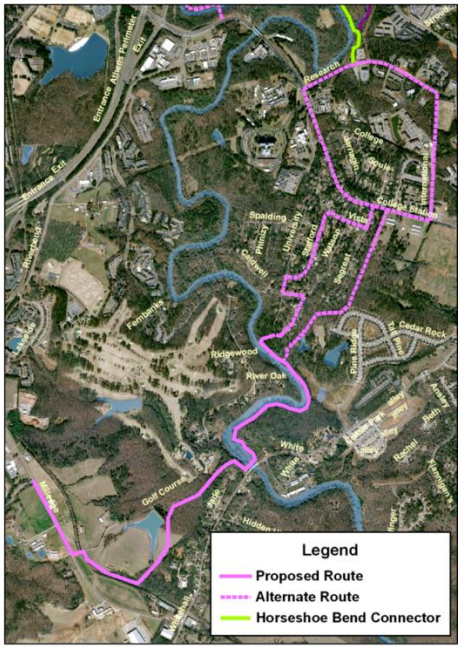


Figure 7 and 8 Horseshoe Bend Connector and Botanical Gardens Connector (Athens-Clarke County Unified Government, 2010).

This study will take a closer look at the Horseshoe Bend Connector as well as a portion of the Botanical Gardens Connector. The Athens-Clarke County Leisure Services Division performed a preliminary analysis of the proposed routes in 2010. The preliminary analysis calculated estimates for land acquisition, construction of the trail network, and operational maintenance costs. The image below shows the proposed routes for the Horseshoe Bend Connector and the portion of the Botanical Gardens Connector that will be examined in further detail. For the purpose of this study, we will refer to phase one as the Horseshoe Bend Connector, phase two as the Research Drive Connector, and phase three as the Vet Med Connector.

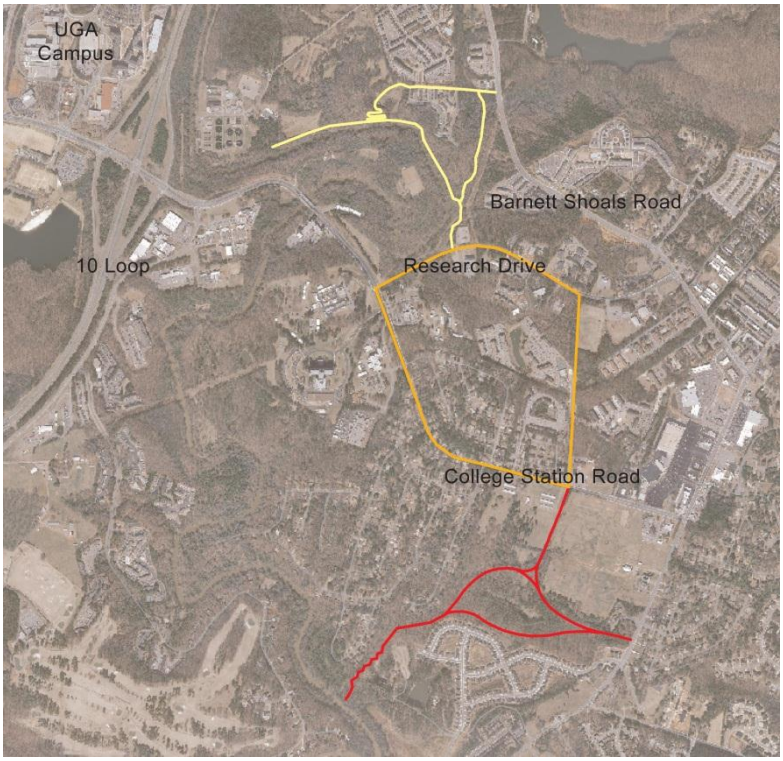


Figure 9 Propose Routes- Horseshoe Bend Connector is shown in Yellow, the Research Drive Connector is shown in Orange, and the Vet Med Connector is shown in Red (by author).

PHASE I – HORSESHOE BEND CONNECTOR

The Horseshoe Bend Connector has been planned to begin at the new wastewater treatment facility located off of College Station Road. The greenway's primary route will continue along the north side of the Oconee River in a natural setting until reaching a Georgia Power substation located off of Research Drive. There are also two proposed alternate routes connecting to nearby residential properties along the way. The proposed route is shown in yellow on the aerial photo below.

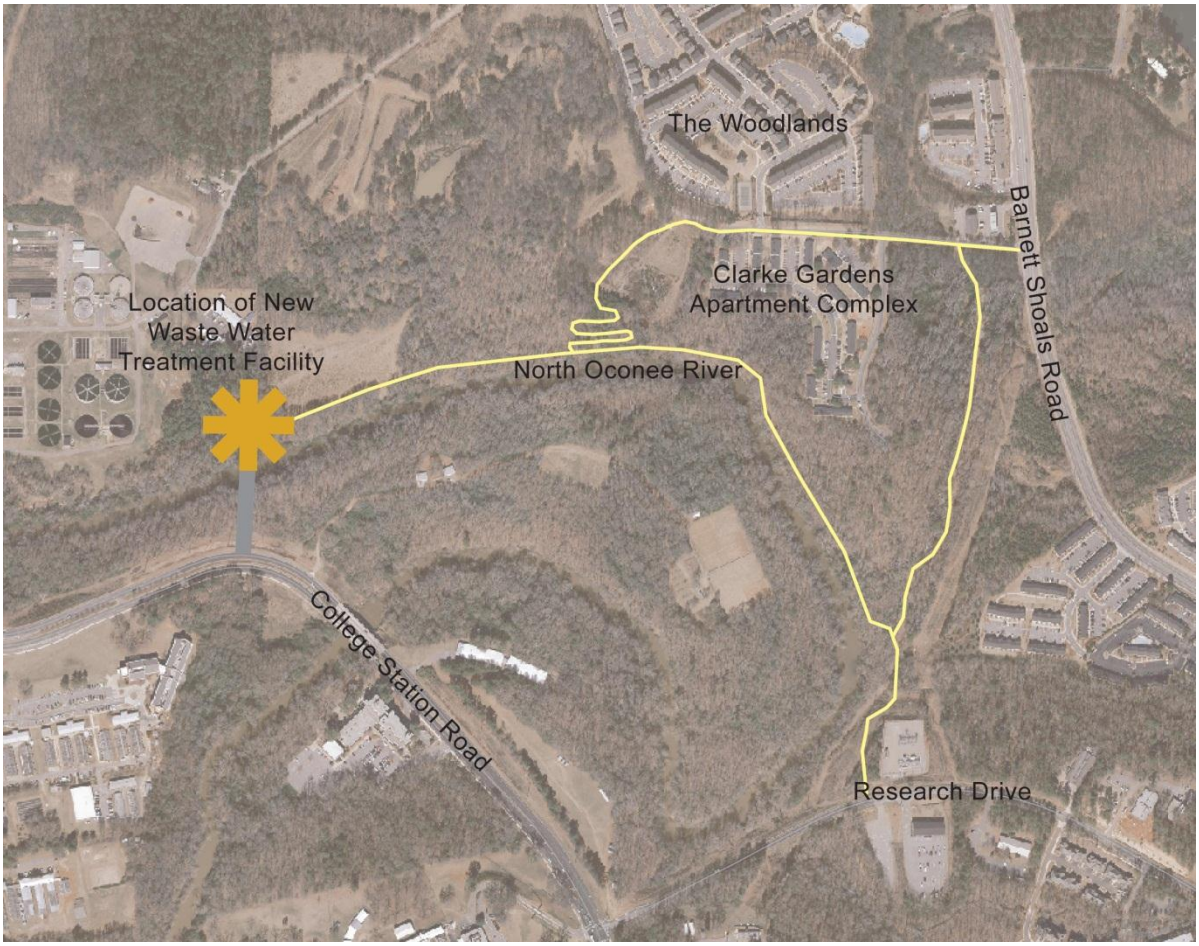


Figure 10 Phase I Aerial Photo, (by author).

Barnett Shoals Road connects the east side of Athens to Lexington Road near the downtown area. Over the past 10-15 years, several residential developments have

been constructed along the Barnett Shoals Road corridor. The suggested alternate routes would provide access for a large number of residents living within a comfortable walking or biking distance from the greenway. For students living in the nearby residential developments, the greenway network would provide a 5-10 minute bike ride of around one mile into the heart of the UGA campus via the proposed Easley Mill Connector. Currently, bikers travelling toward campus or the downtown area from the east side of Athens commute down a busy College Station Road. A 2008 traffic count conducted by the Georgia DOT revealed that from the Barnett Shoals/ College Station intersection to the Research Road/ College Station intersection there was an average daily user load of 16,260 automobiles within the two way traffic. There are bike lanes along a portion of College Station Road, however the narrow Middle Oconee River bridge crossing frequently causes biker and pedestrian conflicts with automobiles. The greenway's Horseshoe Bend Connector would provide a much safer and presumably more enjoyable route from the east side of Athens into the campus and downtown.

The Athens-Clarke County Government owns one large parcel of land along the proposed Horseshoe Bend route that was obtained through a land swap with UGA; however there are a number of parcels owned privately by local residents. Only one of the privately owned parcels has been developed and is currently owned by the Ashton Clarke, LLP. The initial proposal prepared by the Department of Leisure Services estimated the total cost of land acquisition needed for this sub project based on the appraised value of the floodplain within each privately owned parcel that the greenway was routed through. Athens-Clarke County could then purchase the portion of each parcel classified as floodplain from the property owners reducing the total acreage and

cost of private property to be purchase. This strategy brought the total estimated cost of land acquisition for the Horseshoe Bend Connector to $458,000. The following images show each parcel, their property owner, appraised property value, and the location of the 100 year floodplain within each parcel.

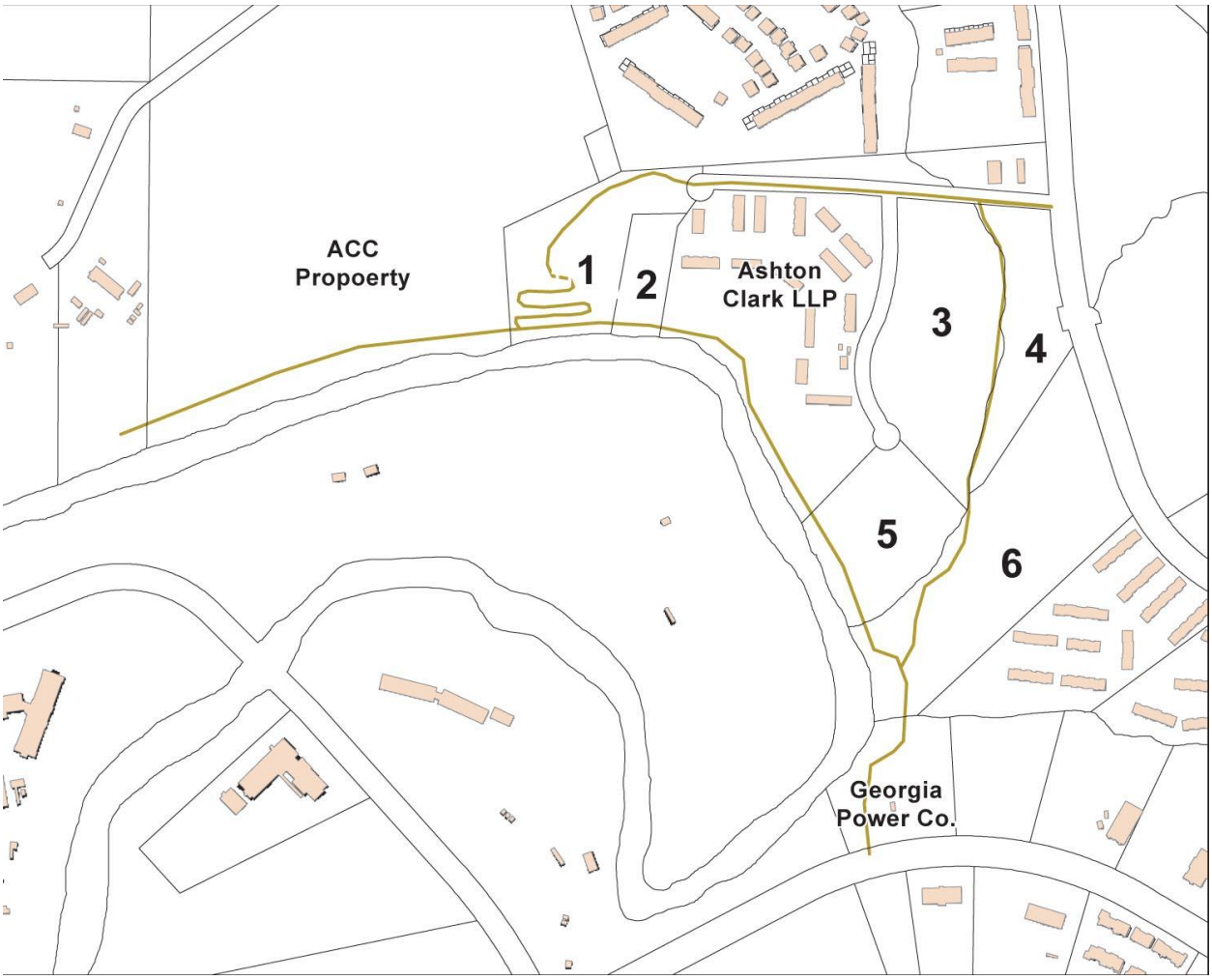


Figure 11 Phase I Parcels, (by author).

Property Owner	Total Acreage	Estimated Value
1 - Carriage Lane Properties	5.01 ac.	$90,933
2 - Carriage Lane Properties	1.62 ac.	$48,600
3 - Marion L. Cartright	6.50 ac.	$255,938
4 - Marion L. Cartright	4.21 ac.	$205,238
5 - Marion L. Cartright	4.57 ac.	$192,797
6 - Marion L. Cartright	8.19 ac.	$368,550

Figure 12 Phase I Parcels Data, (by author).

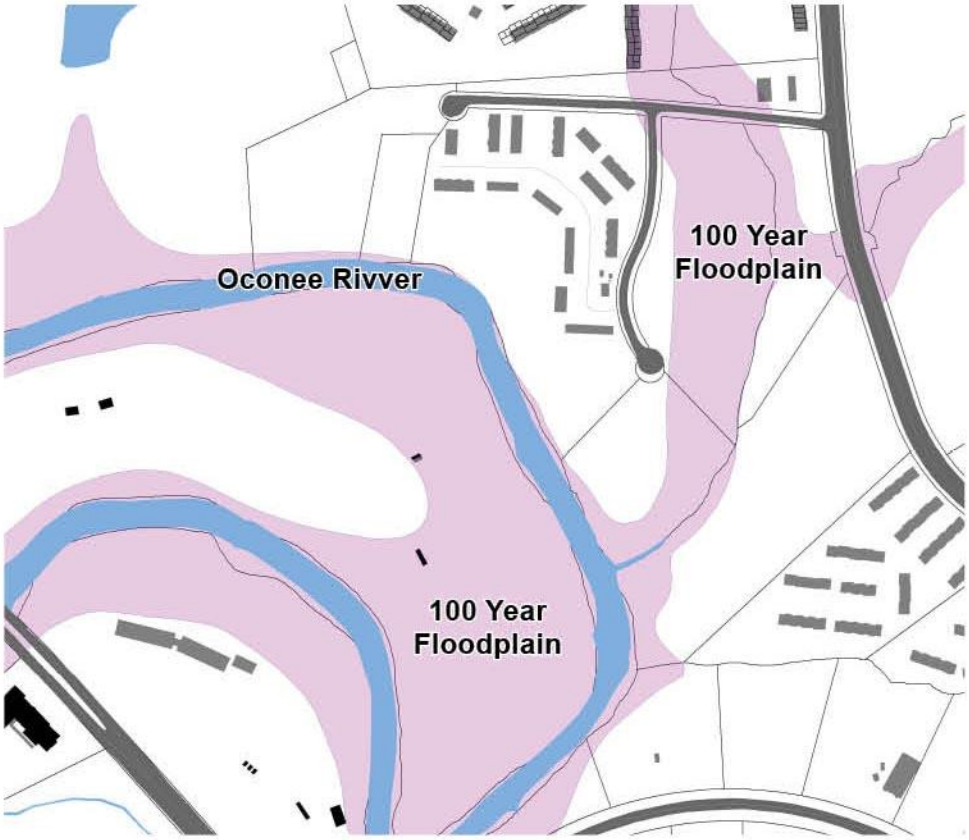


Figure 13 – Phase I Floodplain Location, (by author).

The first affected parcel for Phase One is already owned by the local government and the last affected parcel is owned by Georgia Power. For the purposes of planning this phase, it is assumed that Georgia Power is willing to dedicate an easement through their property allowing the greenway to turn away from the river towards Research Drive. The Ashton Clark LLP would need to dedicate a conservation easement to Athens-Clarke County allowing the greenway to pass through their property along the river. This could both result in a positive tax situation contribution for the Ashton Clark LLP and connecting greenway improvements that increase property value. As mentioned earlier, the Athens-Clarke County government has either purchased the floodplain located within each parcel or the entire parcel at large to implement each section of the trail. When entire parcels are purchased, the land can be left as green space or developed as open space to be used by the surrounding community. At first glance, this method of land acquisition for constructing the Oconee River Greenway Network appears costly and unnecessary. In many instances, large parcels of land are purchased and the greenway has been constructed on a very small portion of the property. In terms of land conservation and open space it is an improvement, but as local governments across the country continue to tighten their budgets this practice becomes financially unfeasible unless the surplus areas are resold or land leased to developers for appropriate usage. With limited funding, innovative solutions such as dedicated conservation easements, resale, or lease agreements are necessary to continue the implementation of the North Oconee River Greenway Network.

The city of Athens is home to one of the largest public universities in the nation. The university employs over 10,000 people and enrolls over 35,000 students each year

(University of Georgia, 2010). As the university continues to expand its campus the need for additional housing to meet the growing demands of students, faculty, and staff also increases. The city of Athens, GA also offers a unique quality of life with things like the Athens Farmers Market, a history of live music and a vibrant downtown scene. The population increased 15.1% from 2000 to 2010– (Wikimedia Foundation, 2011). With a growing population and a variety of income levels there is a constant need for new residential and mixed use developments to replace existing outdated developments. The potential for successful developments in the Athens area provides an opportunity to fund the future implementation of the North Oconee River Greenway Network along the Horseshoe Bend Connector.

The Rails to Trails Conservancy published an article addressing the economic benefits of trails and greenways. They mention that a 1998 research study was conducted revealing that "property values of lots adjacent to the Mountain Bay Trail in Wisconsin sold for an average of 9% more than similar lots not adjacent to the trail (Rails to Trails Conservancy)." They also mention a development in North Carolina, Sheperd's Vineyard, which was able to add "$5,000 to the price of 40 homes adjacent to the regional greenway which were also the first to sell within the development." The Horseshoe Bend Connector area is primarily residential and could have a similar result once the greenway is constructed. "In a 2002 survey of recent home buyers by the National Association of Realtors and Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices (Rails to Trails Conservancy)."

One option Athens-Clarke County could pursue would be to purchase the necessary parcels of land and lease the larger portions not needed for the greenway.

The money generated from the land lease could be used to finance the construction and ongoing maintenance of the greenway after it is built. A developer could enter into a long term lease agreement with the intention of constructing a student housing apartment complex marketing the direct access to the greenway which will eventually connect to the heart of the UGA campus and downtown. Athens-Clarke County also has the option of purchasing the parcels along the greenway and negotiating a sale for the unused portions of each parcel to nearby property owners or other interested parties. The money generated from the property sales could then be used to fund the expenses of constructed and operating the greenway.

A third innovative solution to generate funding for the greenway involves the use of a TAD. In 1985, the state of Georgia's General Assembly adopted the Redevelopment Powers Law giving local governments the ability to sell bonds to finance infrastructure and other redevelopment costs within a specifically defined area known as a Tax Allocation District or TAD (Georgia Municipal Association, 2008). TAD's are permitted in 49 of the 50 states in the U.S. and was first used in the state of Georgia by the city of Atlanta in 1992 (Georgia Municipal Association, 2008). "The bonds are secured by a tax allocation increment which is the increase in property tax revenues resulting from the redevelopment activities taking place within the tax allocation district (Georgia Municipal Association, 2008)." This unique tool can help cities obtain the funds necessary to finance the construction of new public facilities and infrastructure improvements. The greenway is a public infrastructure project providing transportation, recreation, education, and environmental services to the surrounding community. In this case, rather than waiting for additional SPLOST funding to become

available to fund the project, the Athens-Clarke County Unified Government could sell bonds to finance the construction of the greenway. Once the greenway is constructed, the value of the parcels located in the TAD should increase due to their location along the trail network. “As the public improvements and private development take place in the area, the taxable value of property in the TAD increase (Georgia Municipal Association, 2008).” The city, in this case Athens, then takes the increase in revenues as a result of the increased property values and applies them to a special fund allocated to pay off the bonds that financed the public improvements (Georgia Municipal Association, 2008)”. The establishment of Tax Allocation Districts could be used in this way to attract new private developments and fund the construction of the Greenway.

The Horseshoe Bend Connector has the potential to use a TAD overlay to help fund the greenway project and promote redevelopment of adjacent parcels into a cohesive planned unit development. The city has already invested in providing water and sewer services along Carriage Lane, a road just north of the Horseshoe Bend section of the river which is currently used to access two residential developments. The development to the north is “the woodlands”, an extremely successful gated community offering a variety of housing types and craftsman style homes. Carriage Lane provides access to the secondary entrance at the back of this development. The development to the south is Clarke Gardens, an older multifamily housing complex offering section 8 housing. “Section 8 is an affordable housing program that assists very low income families to obtain decent, safe, and sanitary housing while maintaining their rental payments at an affordable level (Marietta, 2007).” The Clarke Gardens complex is in a poor physical condition and also is surrounded on either side by undeveloped parcels

which could be accessed form Carriage Lane. With the proper planning, the area could be redeveloped as a larger planned unit development rather than separate communities.

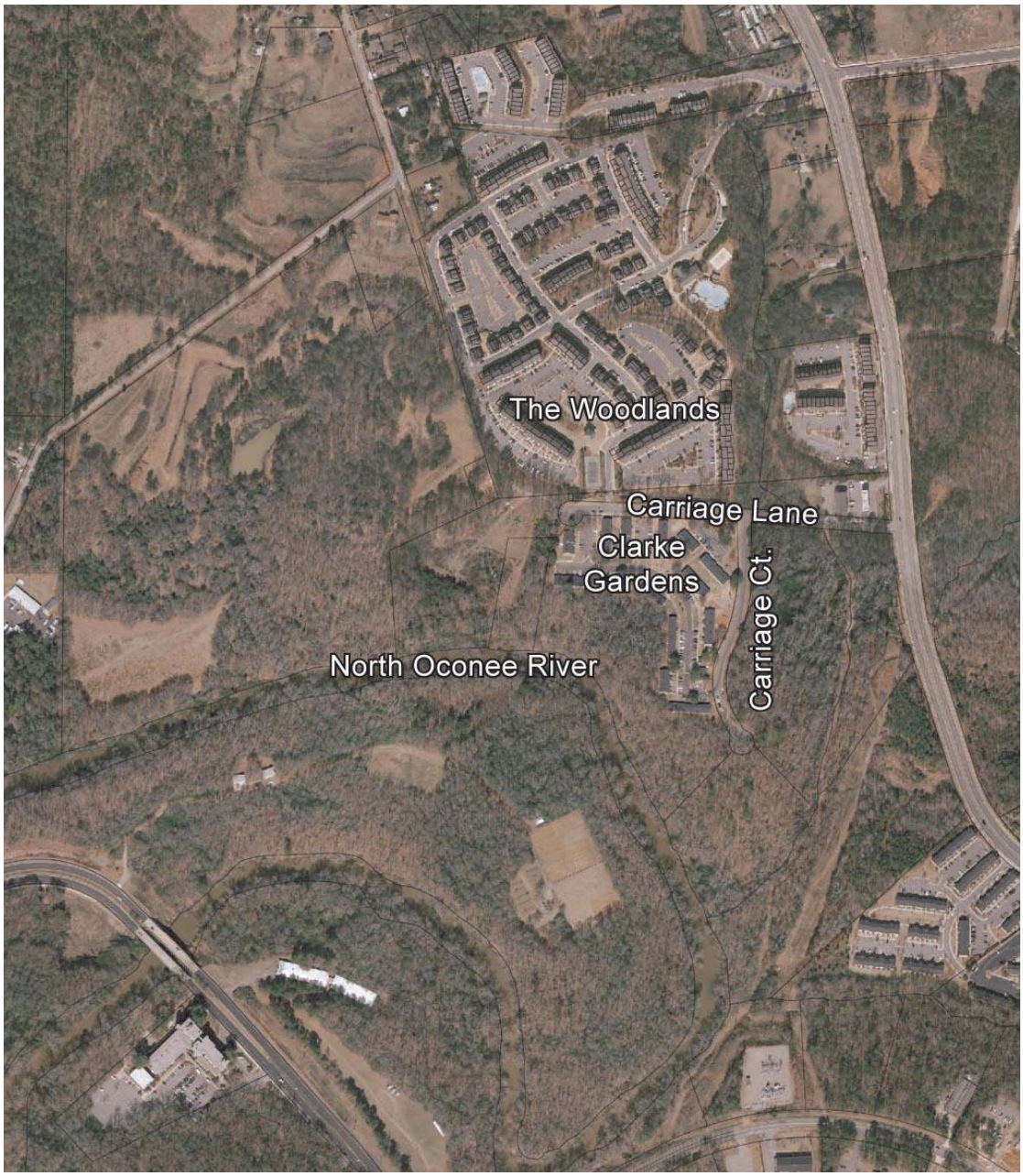


Figure 14 Phase I – Existing Conditions (by author).

Figure 15 Proposed Tax Allocation District, (by author).

The redevelopment of the area could be guided through the use of a Planned Unit Development overlay (PUD). The seven parcels located within the proposed TAD could be rezoned for a mixed use planned unit development incorporating residential and commercial uses. The existing infrastructure at the Clarke Gardens complex could be utilized to create newer and more modern high density apartment or condo units. The parcels on either side could be rezoned to accommodate a medium density

development of cluster homes or townhomes. The parcel located at the corner of Barnett Shoals Road and Carriage Lane could remain under the ownership of the county for greenway access. The parcel located directly off of Barnett Shoals would be most suited for any type of commercial development. The map below illustrates the proposed PUD overlay zoning.

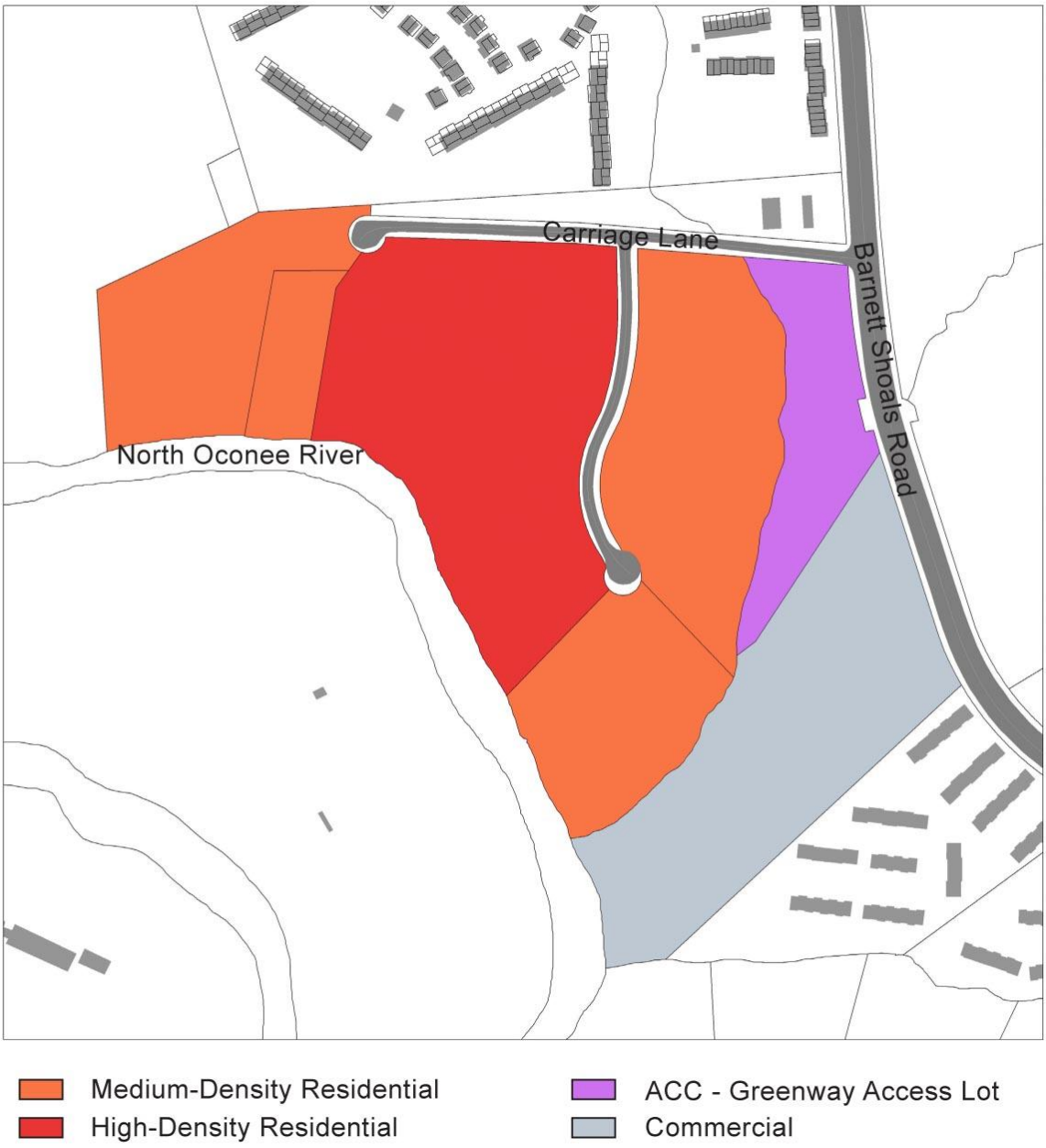


Figure 16 Proposed PUD Overlay Zoning, (by author).

The two parcels located to the west at the end of Carriage Lane could be combined to create one larger developable parcel of land totaling 6.63 acres at an estimated value of $149,533. Both of the parcels are currently owned by Carriage Lane Properties. These two parcels are proposed as medium density residential developments which could be townhomes or a cluster home community. Similarly, the two parcels located on the eastern side of Carriage Court could also be combined to create one larger parcel totaling 11.07 acres for development at an estimated value of $448,735. Both of these parcels are currently owned by Marion L. Cartright. As with the previous two parcels, the proposed zoning for these is medium density residential. The center parcel, which is currently a high density multifamily residential apartment complex, could be redeveloped as new apartment or condo units utilizing the existing road and utility infrastructure. The parcel located at the corner of Carriage Lane and Barnett Shoals is adjacent to a tributary stream and development should be kept to a minimum. The corner location at the intersection and proximity to the tributary stream creates an ideal location for a community access lot for nearby residents. Therefore the proposed zoning for the PUD shows this parcel remaining in the ownership of the county. This parcel is a total of 4.21 acres at an estimated $205,238. Finally, the parcel located off of Barnett Shoals Road, a five lane arterial connector, is most suited for commercial development and therefore is zoned such. This parcel is a total of 6.19 acres with an estimated value of $368,550.

The following image shows a conceptual rendering of this phase with the greenway running along the north side of the river and the planned unit development on the proposed parcels.

Figure 17 Conceptual Rendering of Planned Unit Development (by author).

Figure 18 Enlargement of Residential Portion of PUD (by author).

The residential portion of the PUD is shown in the enlargement on the image above. The existing infrastructure has been expanded to serve one larger

interconnected development. The higher density apartments are located in the center, surrounded by medium density townhome unites on either side. This conceptual plan fits 52 townhome units and a total of 10 three story apartment/condo buildings with a total of 240 units at 8 units per floor. The layout of the roads and buildings works with the natural topography of the land to minimize disturbance and capture views of natural areas. Medium and high density developments would serve a large number of people and maximise the use of public infrastructure investments. A lower density residential development would require significantly more grading and longer runs of utility lines to serve each home. Residents within the development would have immediate access to the greenway providing a quick route of less than one mile to the heart of the UGA campus and just over one mile to downtown Athens.

It would be advised that Athens-Clarke County purchase the corner parcel with with the intention of developing a parking lot, bathrooms, maintenance facility, and secondary trail connecting to the primary greenway trail. The location at the corner of Barnett Shoals Road and Carriage Lane makes this an ideal spot for nearby residents in the surrounding area to access the greenway trail. It would also provide a location to store maintenance equipment and provide access for city employees to monitor the Horseshoe Bend Connector. The following images show a conceptual layout for the community access lot and building as well as the topography.

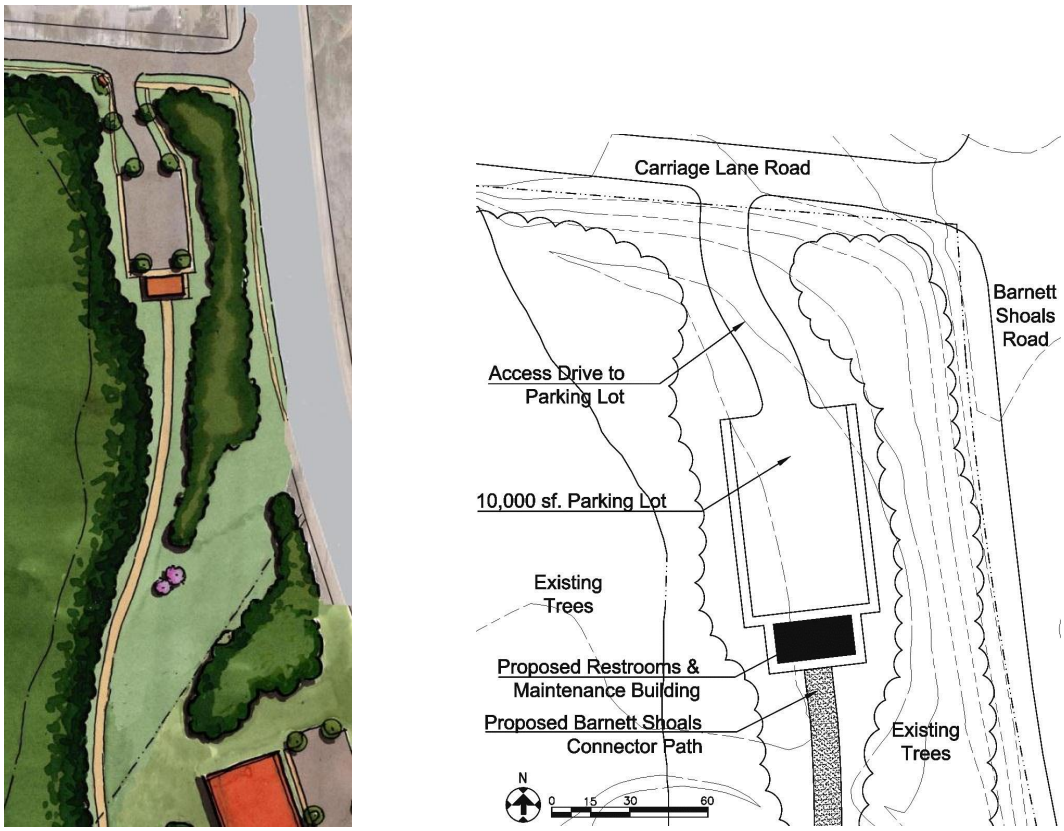


Figure 19 Enlargement of Barnett Shoals Community Access Facility (by author).

The image on page 26 shows the surrounding area that could gain access to the greenway trail through the community lot within a short distance. Concentric rings are shown in ¼ mile, ½ mile, and 1 mile radius from the lot's location. You can see that a large number of residential developments fall within the 1 mile radius. As Barnett Shoals continues to be developed, an even larger number of users could gain access to the trail though the community lot.

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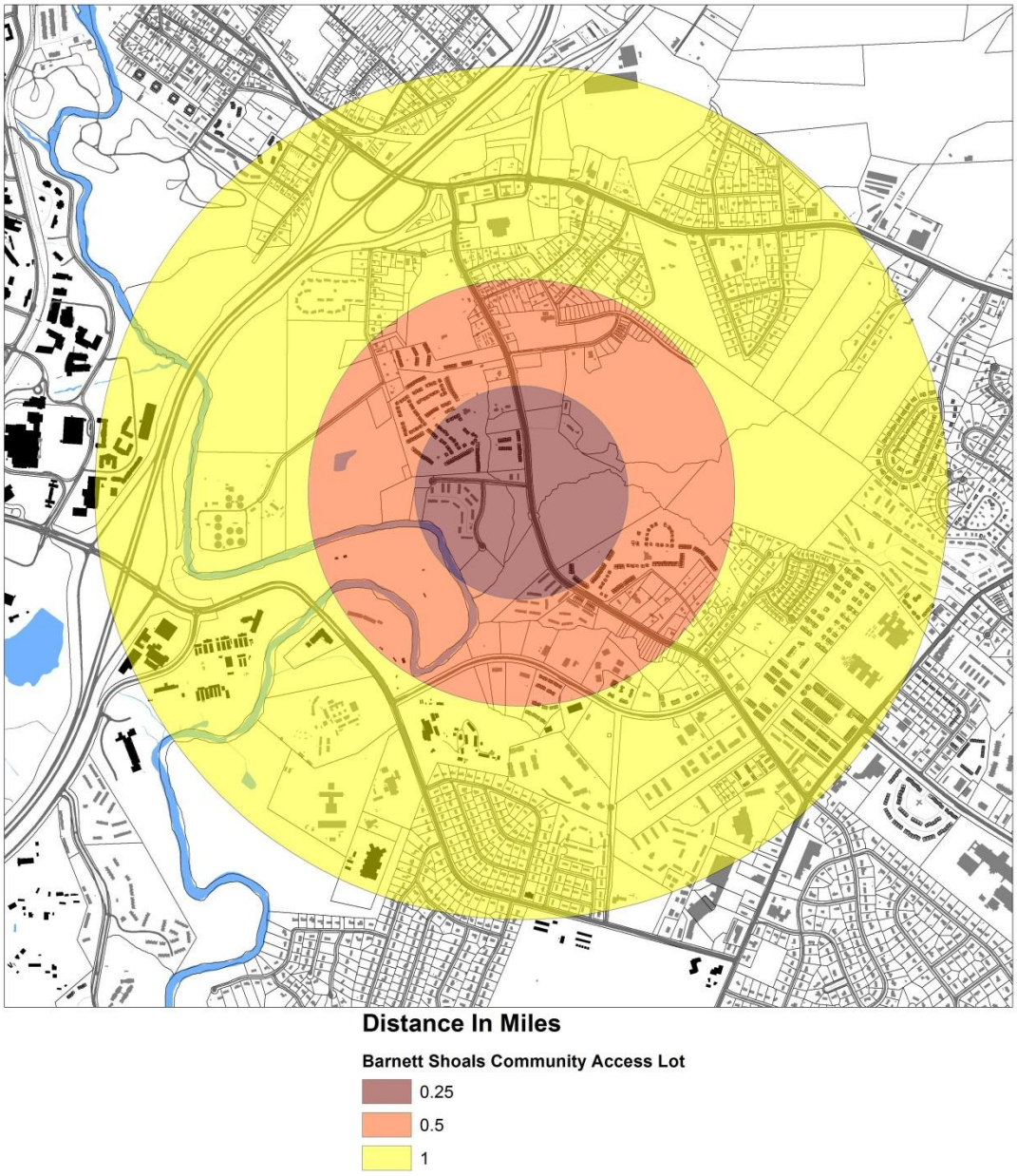

Figure 20 Distance in Miles from Barnett Shoals Lot, (by author).

Figure 21 – Phase I Commercial Development, (by author).

The proposed commercial development has again been laid out in a way to minimize their impact on the natural environment and drainage of the area. Proposed buildings and roads follow existing contours in an effort to minimize grading requirements. Given their proximity to the tributary stream, river and its floodplains disturbance in the area should be kept to the minimum amount possible. The conceptual drawing illustrates two 100' x 200' commercial buildings and parking for each. The secondary connecting trail also runs through the back of the parcel.

The primary route for the Horseshoe Bend Connector follows along the north side of the North Oconee River. The floodplain along the north side of the river is

relatively flat and wide enough to accommodate the width of the desired trail. Bike trails should avoid grades above 5% for any significant length (Dines, 1998). The thoughtful placement of trail location along relatively flat grades will enable the trail to remain at a consistent 10' width as recommended by the Greenway Network Plan. However, separating bicycle riders from pedestrians walking or jogging will increase safety and provide for a better experience for users. As the greenway network continues to expand into new neighborhoods, it can be predicted that more residents will access the trail during peak hours. The increase in users will put bikers and pedestrians at a greater risk of conflict with one another. It is recommended that the trail is separated by two types of tread, a 10' paved lane for non-motorized users (bikes, rollerblades, skateboards, etc.) and a 6' aggregate path for pedestrians (John Wiley & Sons, Inc., 2006). The drawing on the page below shows the multi-use, multi-tread path totaling 16' in width. Whenever feasible, this path type is recommended. The entire phase of the Horseshoe Bend Connector contains adequate space to implement this type of trail.

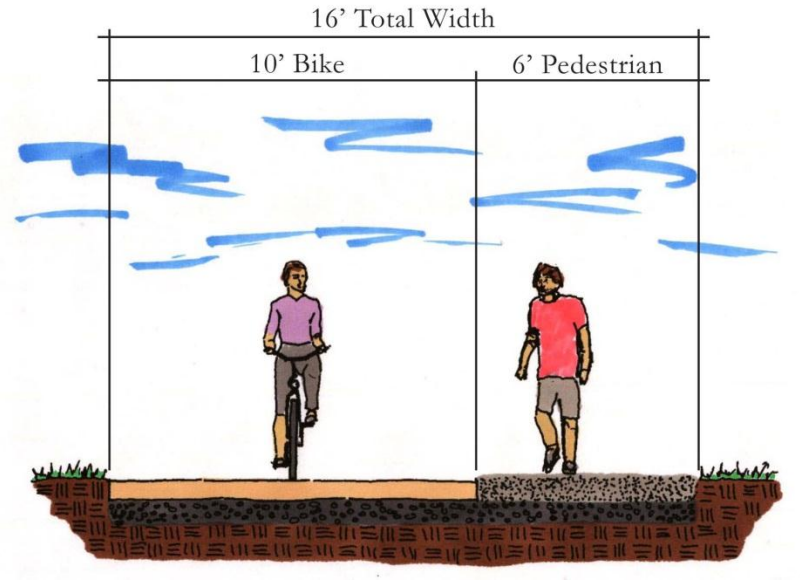

Figure 22 Proposed Greenway Path Section, (by author).

Figure 23 Proposed Greenway Path Sketch, (by author).

This segment of the greenway trail will require minimal grading with the exception of three locations. The three locations will require bridges to cross natural drainage channels. The primary route for the greenway, secondary route for the Barnett Shoals Connector, and the potential bridge locations are depicted on the map displayed on the following page. The proposed bridge locations as well as the Barnett Shoals Connector location are enlarged in greater detail on pages 25-28.

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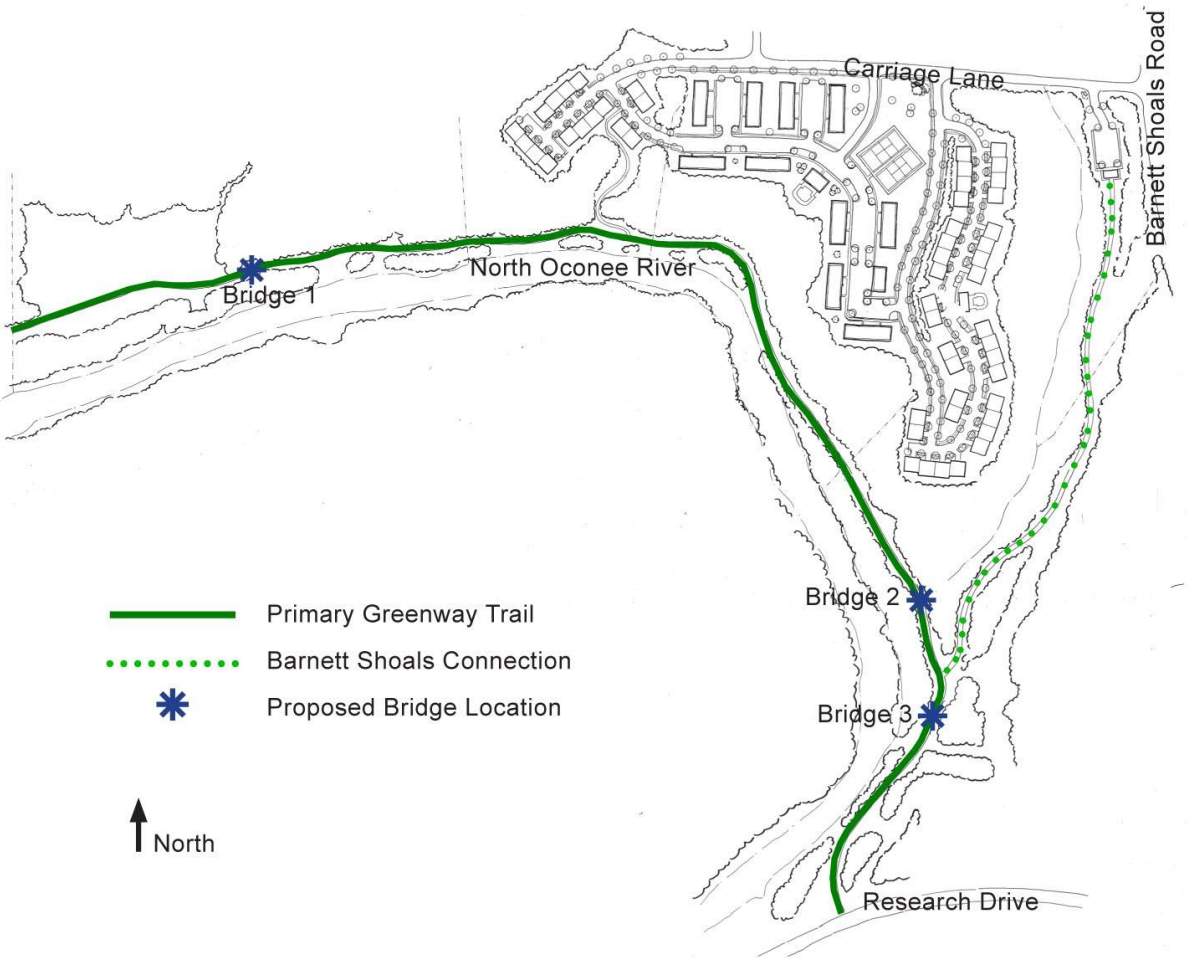


Figure 24 Horseshoe Bend Trail Network (by author).

Figure 25 Horseshoe Bend Connector Topography A, (by author).

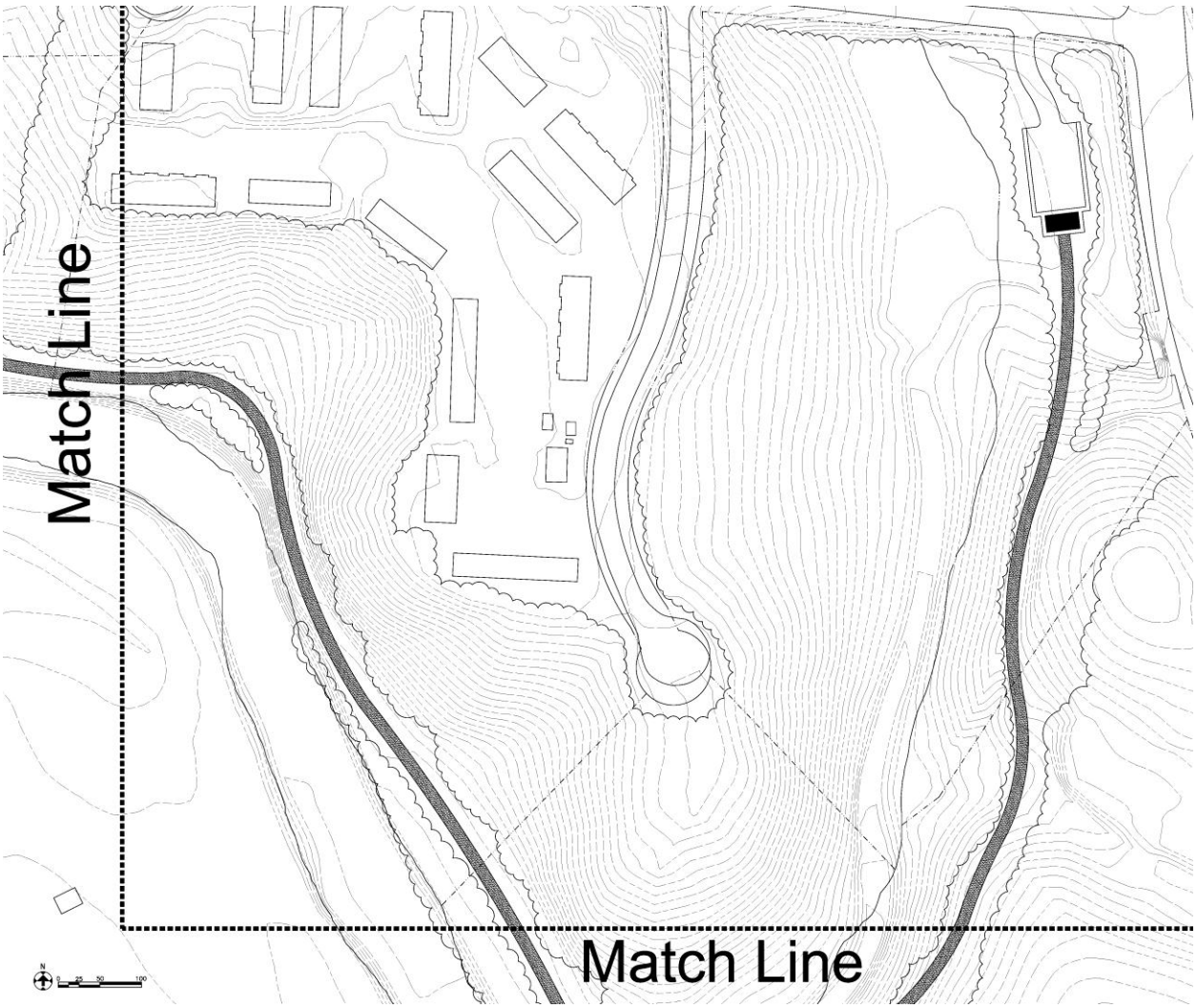


Figure 26 Horseshoe Bend Connector Topography B, (by author).

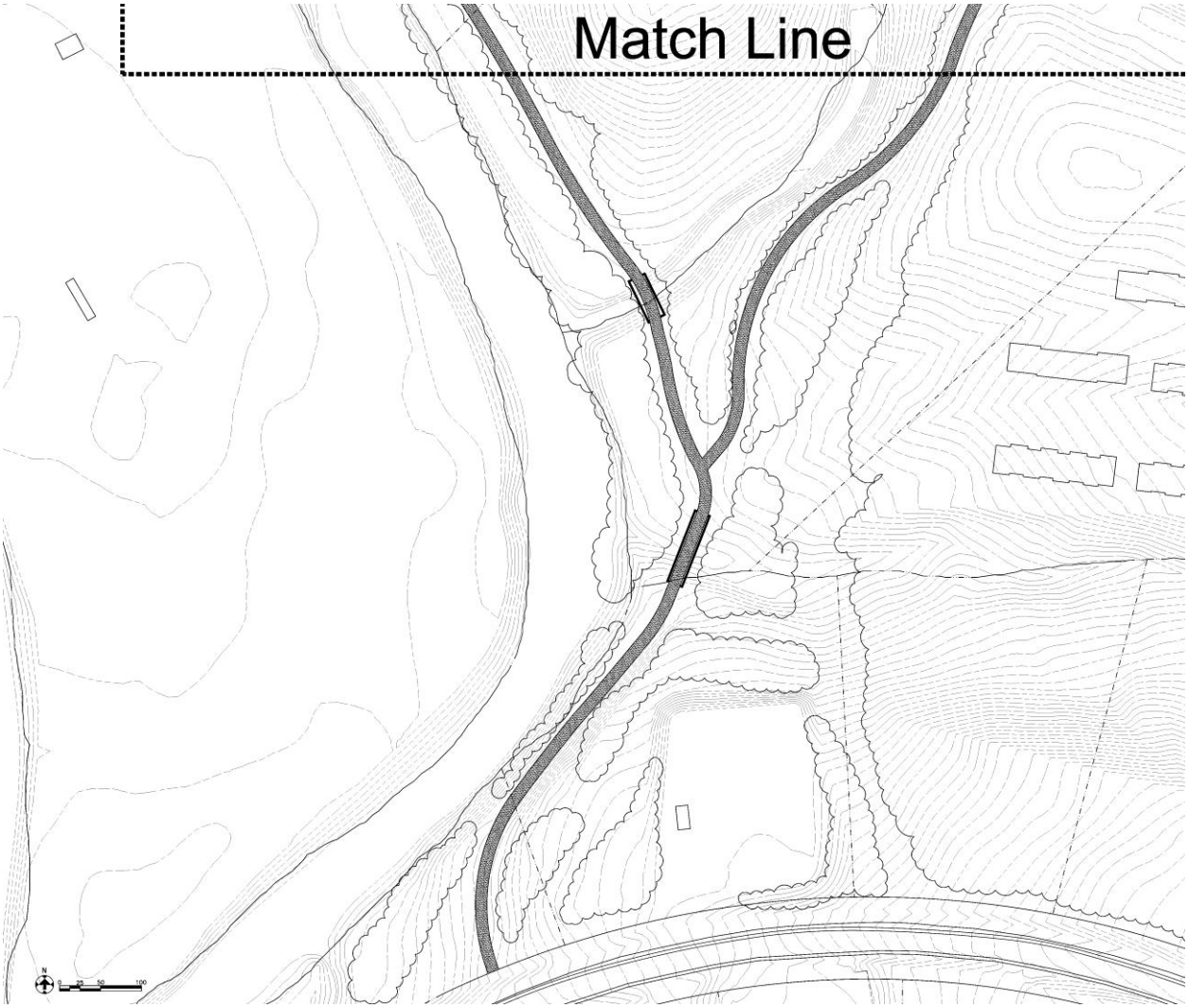


Figure 27 Horseshoe Bend Connector Topography C, (by author).

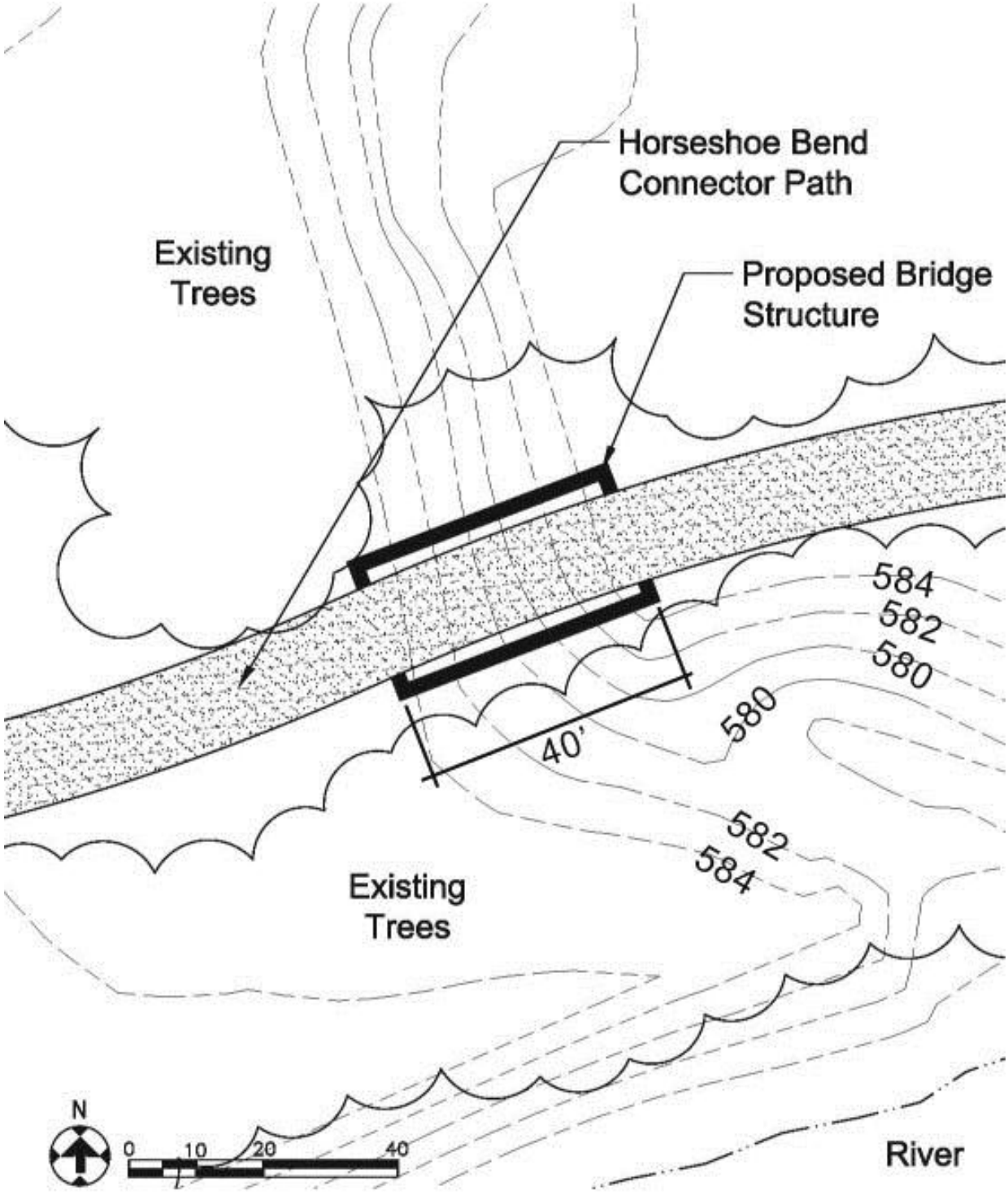


Figure 28 Horseshoe Bend Connector Bridge 1, (by author).

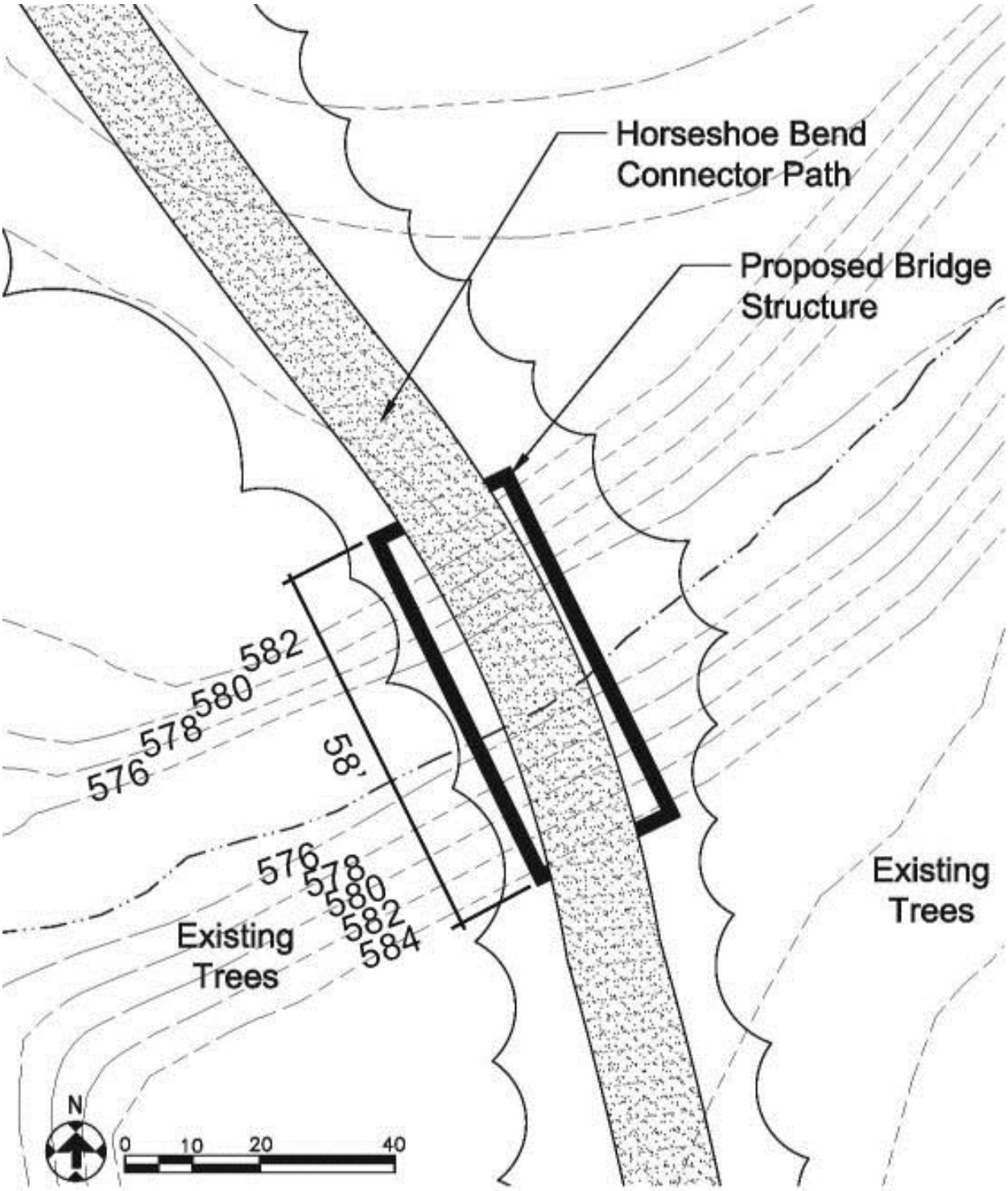


Figure 29 Horseshoe Bend Connector Bridge 2, (by author).

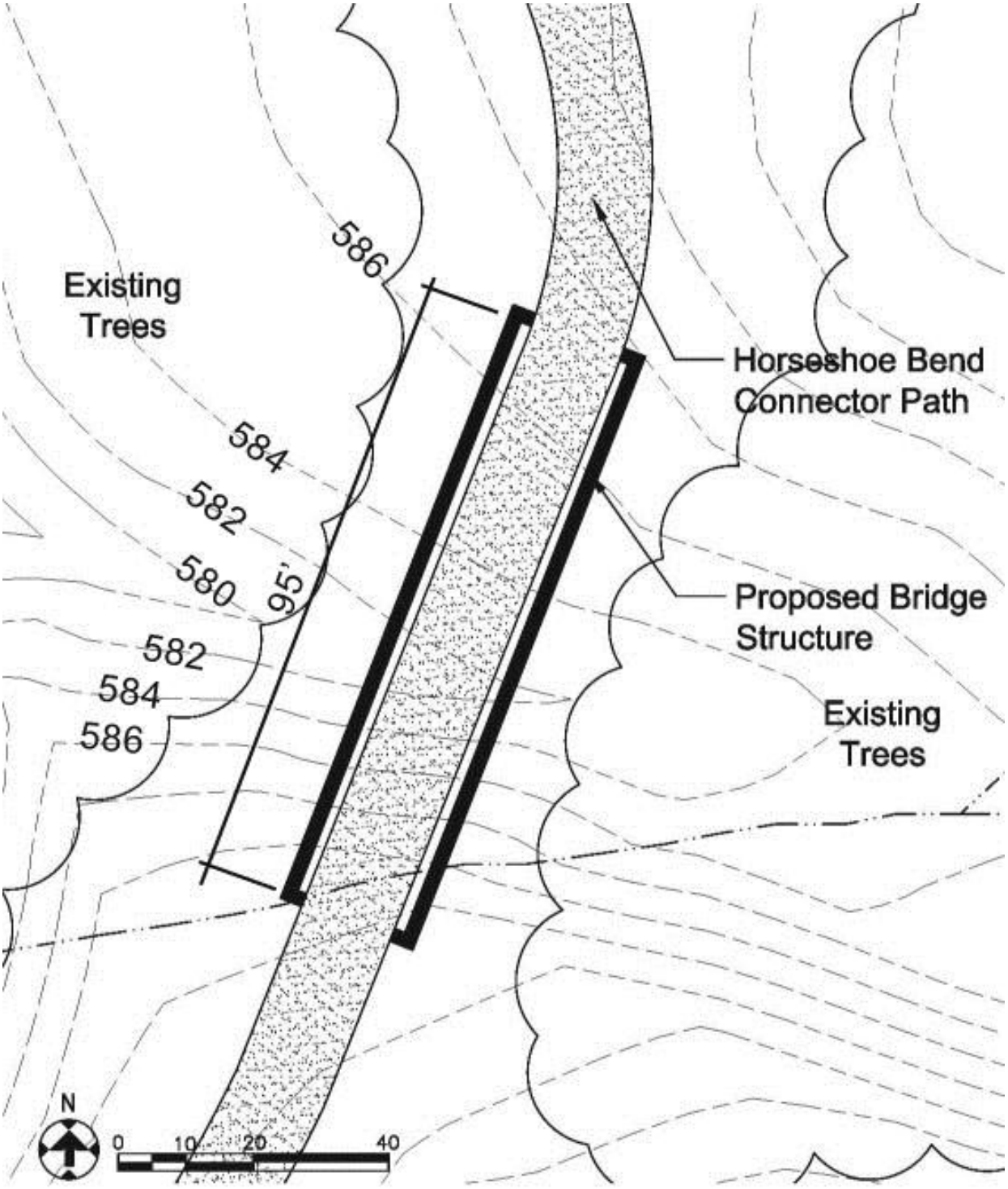


Figure 30 Horseshoe Bend Connector Bridge 3, (by author).

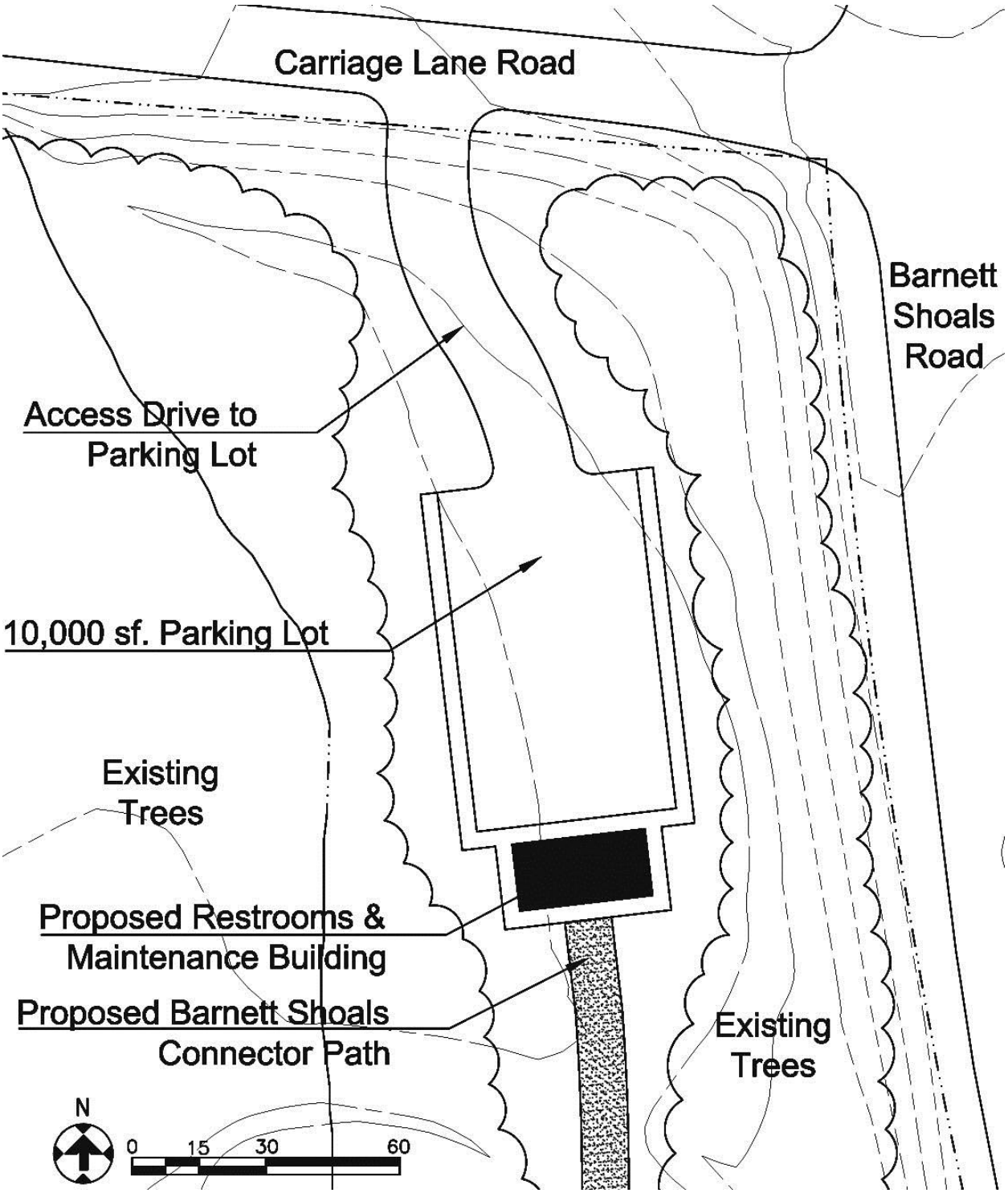


Figure 31 Barnett Shoals Community Access Facility, (by author).

PHASE II

RESEARCH DRIVE CONNECTOR

Phase two of the proposed North Oconee River Greenway Network begins adjacent to the Georgia Power sub-station off of Research Road. This phase includes a primary route that utilizes widened sidewalks and bike lanes along Research Road, an existing utility easement, and widened sidewalks along International Drive. A secondary route also utilizes enhanced sidewalks and bike lanes along Research Drive and College Station Road. The two routes could be combined by users to create a 1.8 mile loop.

This portion of the trail does not run along the river due to expected resistance with private property owners in the University Heights subdivision. The rear property line of each lot along the river in University Heights runs down the centerline of the Oconee River. This would require an easement to be granted to the city by each private property owner if the greenway were to continue along the north bank of the river. However, the University of Georgia owns a large parcel of land which is in the process of being planned as the future home of the College of Veterinary Medicine. The Oconee River is located just to the south of the parcel, providing a solution for the greenway to reconnect along the river and avoid difficult and expensive negotiations with private property owners. The proposed phase two loop is shown on the following map with the street names labeled.

Figure 32 Phase II Proposed Route (by author).

The portions of the greenway that will run along Research Drive, College Station Road and International Drive will consist of either a 5 foot sidewalk adjacent to the road and bike lanes along the edge of the roadway or one 10 foot sidewalk to accommodate bikers and pedestrians. Research Drive currently has bike lanes along either side of the roadway however sidewalks exist only on a small portion of the road along recently developed parcels. College Station Road currently has sidewalks along the northern side but lacks bike lanes on either side and a sidewalk on the southern side. The total length of necessary bike lanes to complete the loop is just over 4,100 linear feet. The Athens-Clarke County Planning Department currently plans to submit a proposal for SPLOST funding to add additional bike lanes along all portions of College Station Road. International Drive currently has a 5' sidewalk along one side of the road that will need to be expanded to a total of 10' to accommodate bikers as well. The total length of sidewalk expansion required on one side of International Drive is just over 1,500 linear feet. The portion of the greenway between Research Drive and International Drive along the easement will revert back to the desired Path Type A with a 16 foot width (10' paved bike lane and 6' aggregate walk lane). The right of way for each roadway and the ACC easement property is shown on the image located on page 42. A map depicting locations along Research Drive, College Station Road, and International Drive that would require the construction of sidewalk and or bike lanes is shown on page 33. The topography adjacent to the roadways and through the Athens-Clarke County easement can easily be graded to maintain a maximum slope of 5% or less.

Figure 33 Phase II Parcels and Right of Way Map (by author).

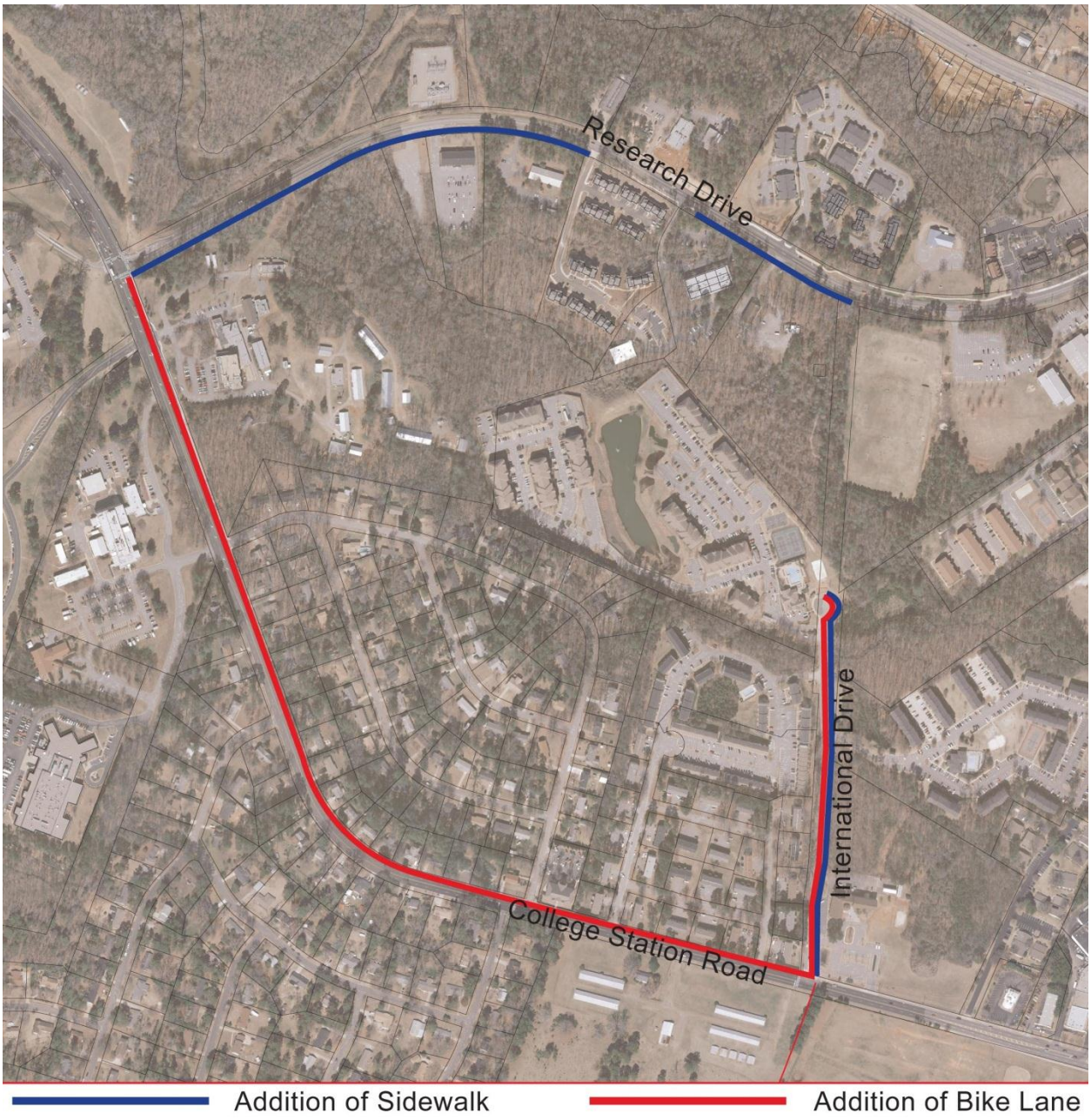


Figure 34 Phase II Road Improvements (by author).

Figure 35 Conceptual Rendering of Phase II (by author).

Phase III

Vet Med Connector

Phase three of the proposed Oconee River Greenway Network continues through University of Georgia property as well as several other privately owned parcels of land before reconnecting with the North Oconee River. This phase provides an opportunity for the University of Georgia to engage the local community as it continues to expand into the east Athens area. There is also a portion of the UGA parcel that could potentially be developed into a parking hub for residents of the surrounding area to gain access to the greenway.

The proposed route for this phase of the greenway begins at College Station Road directly across from International Drive. The first parcel of property the trail will pass through is primarily undeveloped land owned by the University of Georgia. The greenway is then planned to continue southwest passing through two additional undeveloped parcels before reconnecting with the North Oconee River. There are two minor stream crossings along this phase of the greenway as well as several areas which will require extensive grading to remain at the desired 5% slope or less along the path. The following aerial photo shows the proposed phase 3 route in red. Phase III is surrounded by mostly residential developments including University Heights Subdivision, Pinecrest Community, and several other single family and multifamily neighborhoods located off of Barnett Shoals and College Station Road.

Figure 36 Phase III proposed route with aerial photo (by author).

Figure 37 Phase III Parcels (by author).

Property Owner	Total Acreage	Estimated Value
1 - Pinecrest Community Association	2.87 ac.	N/A
2 - Pinecrest Community Assocation	12.03 ac.	N/A

Figure 38 Phase III Parcel Data (by author).

The University of Georgia has expressed a desire to incorporate the greenway through the future Veterinary Medicine site as shown on the maps. This parcel will come at no additional expense for Athens-Clarke County. The parcels labeled 1 and 2 on the map are part of a larger planned unit development owned by the Pinecrest Community Association. An easement could be negotiated with Pinecrest Community Association to cross through the corner section of the northern parcel labeled 1. The parcel labeled 2 on the map is significantly larger and will require extensive grading due to steep topography. It should be expected that a purchase amount will need to be negotiated with the Pinecrest Community Association to utilize this parcel of land. Depending on the density of the development, the Pinecrest Community parcels could be reserved as current green space or could potentially be dedicated to the county as a conservation easement.

The University's College of Veterinary Medicine (CVM) has plans to construct a new veterinary hospital on the University of Georgia parcel. Eventually, the college plans to add academic and research components fronting along College Station Road. The southern portions of the site are to remain wooded due to steep grades and a tributary stream that flows south into the Oconee River. The majority of this site is currently used as pasture land and the intense proposed development for the campus expansion into east Athens will significantly change the character of the area. Incorporating the greenway into the site to be used by UGA students, faculty, and staff as well as east Athens residents will enhance community enthusiasm for the project. In return, the Athens-Clarke County Unified Government will gain access through the property and avoid costly land acquisition funds that would be needed to route the

greenway through the University Heights subdivision. This site provides an amazing opportunity for the greenway to re-engage nature as it winds towards the Oconee River located a short distance behind the UGA parcel. This portion of the greenway will create a truly unique experience travelling alongside several paddocks providing views of horses and other animals being treated by the hospital. The College of Veterinary Medicine has plans to relocate to this site in a series of phases. The greenway could be incorporated into any of these phases as funding becomes available. The image below is a conceptual rendering of the future master plan for the site that was created by a team of graduate students in the MEPD program. The greenway is proposed to follow along the main entrance drive into the campus and a place holder for the greenway trail has been shown throughout the wooded area to the south.

Figure 39 UGA College of Veterinary Medicine Master Plan - Low Density Concept (Provided by MEPD Graduated Assistants Charles Rapp, Carol Myers Flaute and Melissa Holcombe).

Utilizing the conceptual plan prepared for the CVM, the entire phase III greenway plan is shown in the rendering below. This phase offers a variety of experiences for greenway users as they wind their way alongside large animal paddocks, through dense forest canopy, and downhill towards the North Oconee River.

Figure 40 Phase III Conceptual Rendering (by author).

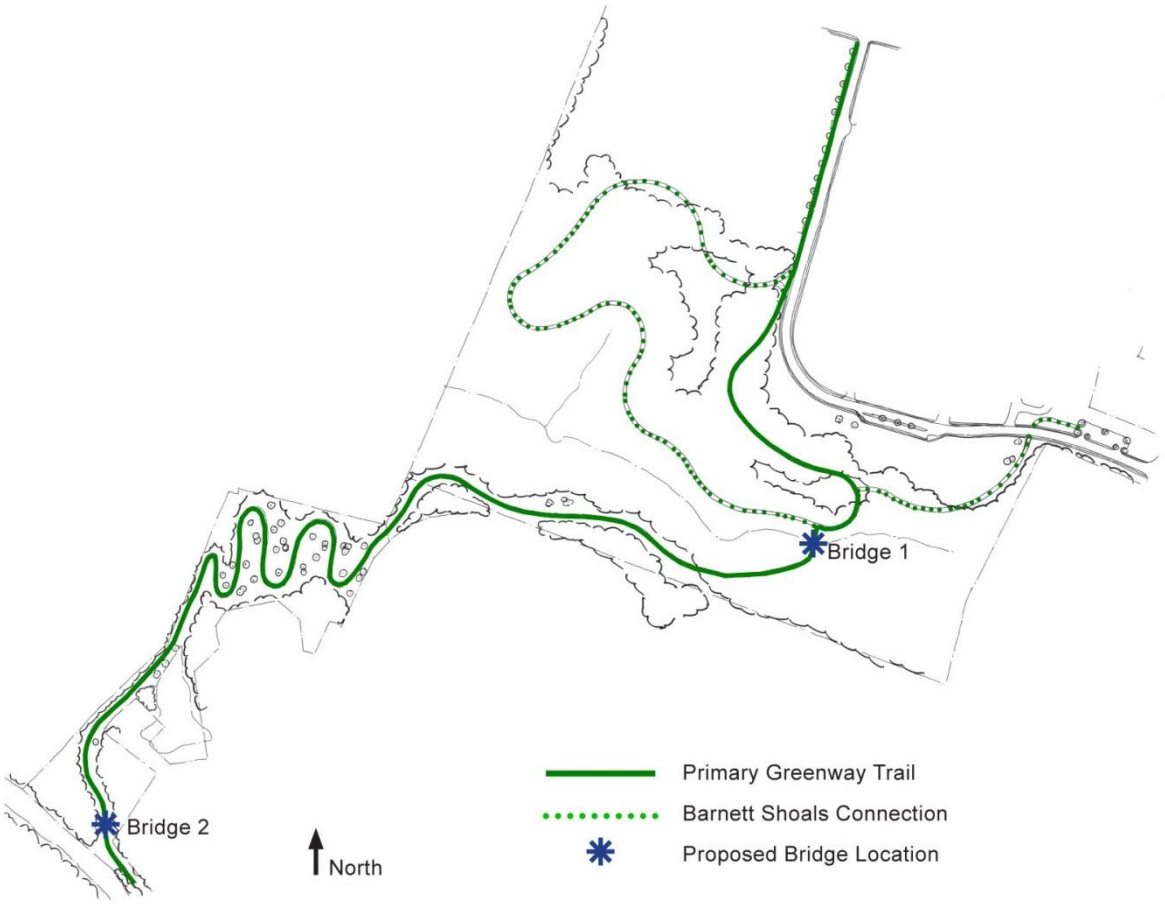


Figure 41 Phase III Trail Network, (by author).

The veterinary site offers an opportunity to incorporate a secondary trail creating a .9 mile loop following the natural topography of the land that winds along the edge of the forest and north bank of a tributary stream. Grades on the UGA parcel allow for the trail to remain under a 5% gradient with minimal disturbance to the surrounding area. There is one location showing a proposed bridge that will be used to cross an existing tributary stream toward the south of the UGA parcel. A grading study revealed that constructing a bridge would eliminate the need for a significant length of additional trail

to navigate around the stream. Two retaining walls would be required to avoid grading onto adjacent parcels. Therefore, one bridge crossing was determined to be the more viable option.

There is also adequate space along the proposed campus entrance coming in from Barnett Shoals Road to provide a trailhead parking lot for nearby residents to gain access to the greenway. The access lot could be placed adjacent to the newly constructed ACC fire station combining two civic land uses owned by the county, enhancing the presence of the local government within the neighborhood. The location at the corner of Barnett Shoals Road and the new Vet Med campus entrance would allow easy access for members of the surrounding community while still discouraging traffic from entering the interior of the campus. The proposed parking lot could serve a large number of single family and multi-family residential subdivisions living in close proximity as shown on the map located on the following page. The map shows concentric rings with in ¼ mile, ½ mile, and 1 mile of the proposed lot location.

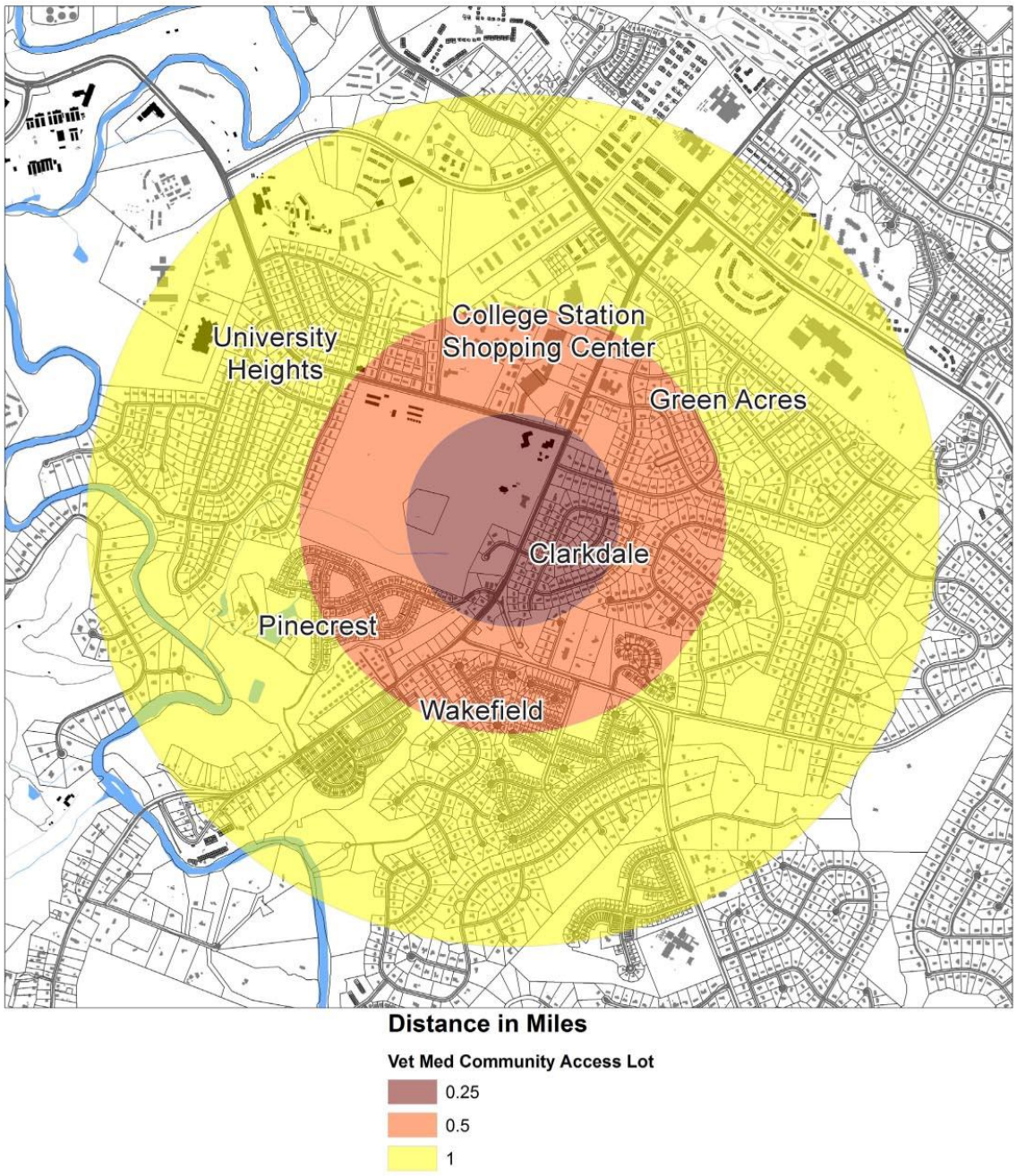
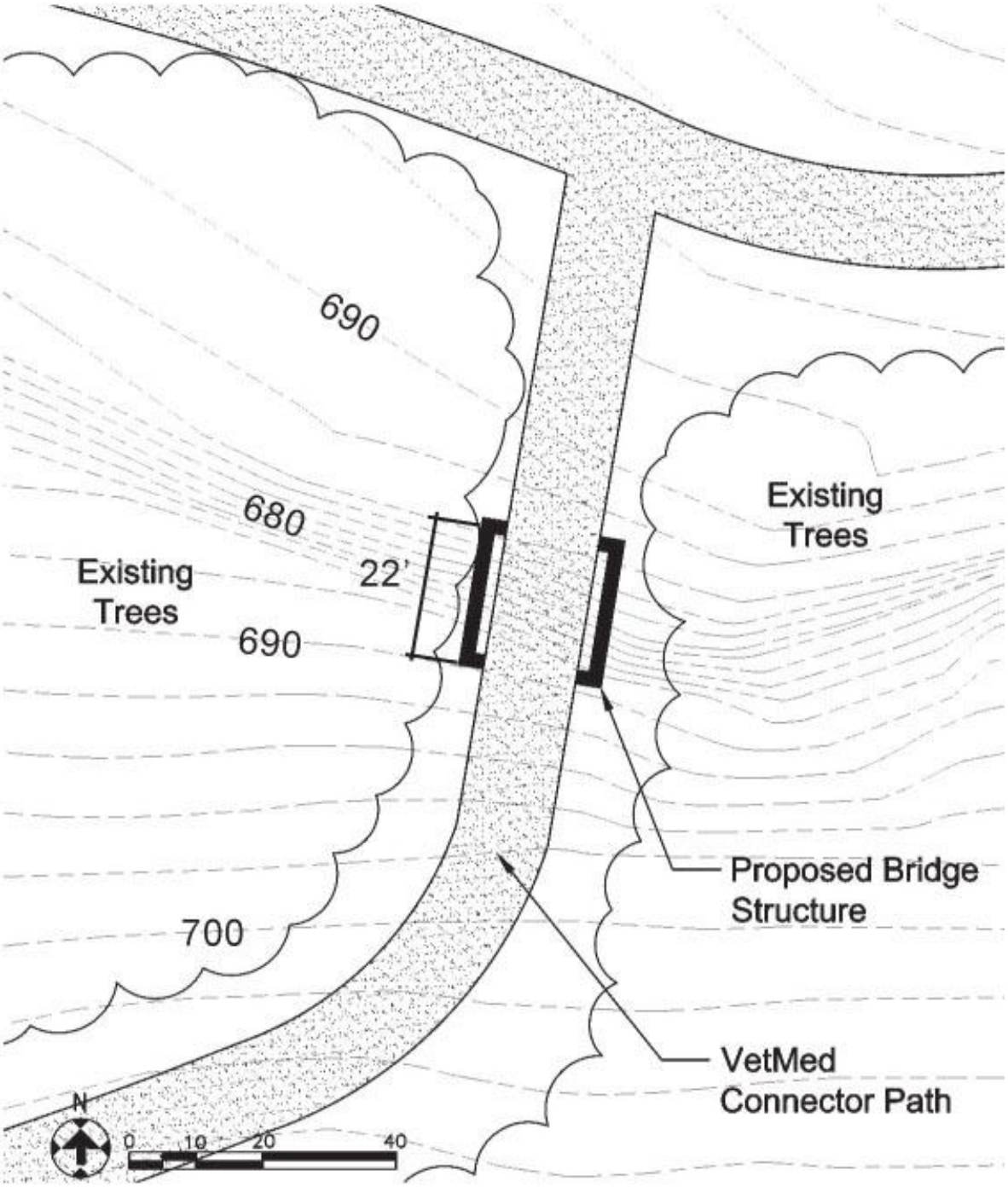


Figure 42 Distance from Vet Med Community Access Lot, (by author).

An enlargement of the conceptual plan for the Vet Med parcel along with enlargements of the proposed parking lot and bridge crossing are shown on the following pages.

Figure 43 Vet Med Conceptual Plan Enlargement, (by author).

Figure 44 Vet Med Connector Topography A, (by author).



Bridge Crossing on UGA Parcel

Figure 45 Vet Med Connector Bridge 1, (by author).

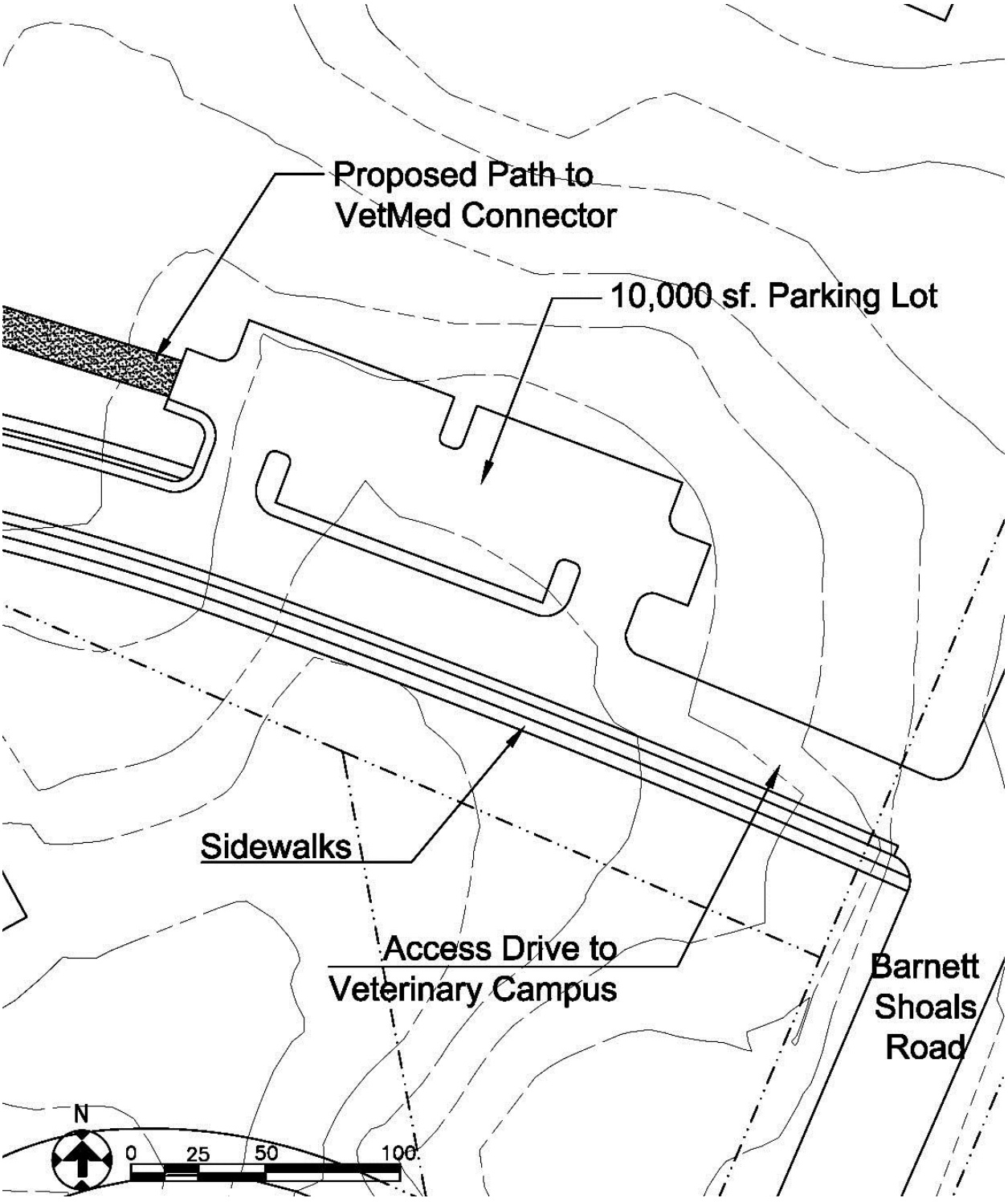
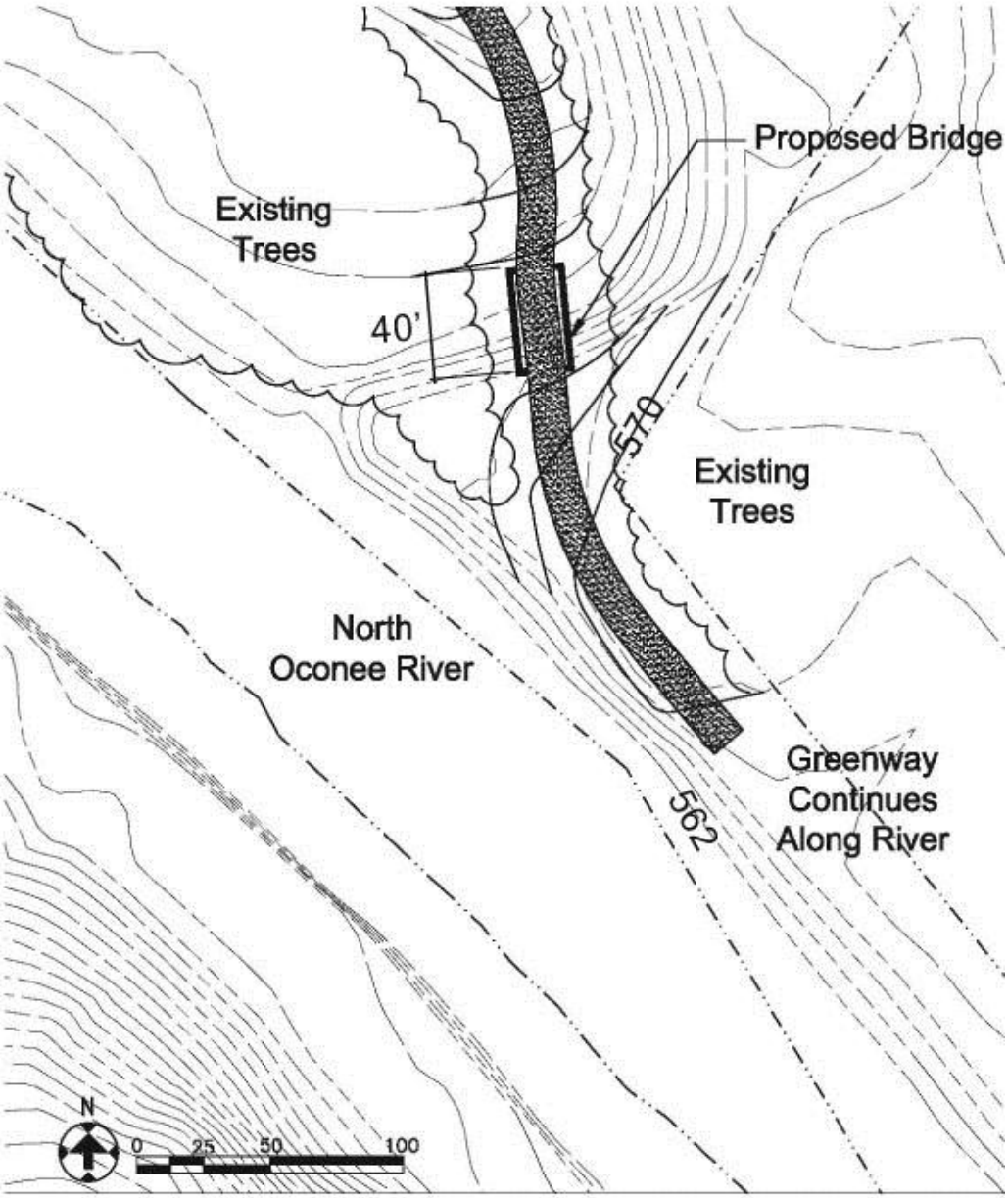


Figure 46 Vet Med Community Access Lot, (by author).

Figure 47 Vet Med Connector Conceptual- Southern Section, (by author).

As the greenway path continues through the remaining two parcels, grading becomes much more of an issue. The path can be constructed without the use of walls, however there will be extensive grading along this portion of the trail and switchbacks are required to keep the path below the desired 5% gradient. A grading study is shown on the following map. This portion of the greenway also has 1 proposed bridge crossings as shown on the trail network map earlier. The path maintains a 5% gradient without the use of walls, however constructing retaining walls in several areas would reduce the height of slope along the sides. Another option is to increase the path to a gradient near 8% or even 10% in some areas to alleviate the need for walls and excessive grading. If steeper areas are kept to a minimum and spaced appropriately, they will provide variation for the user. Drainage during intense storms could become an issue due to the steep slopes on either side of the path. This area will also require a significant amount of replanting vegetation in the area of the switchbacks due to the large expanse of grading. A conceptual grading plan along with an enlargement of the proposed bridge location is on the following pages.

Figure 48 Vet Med Connector Topography B and Conceptual Grading Plan, (by author).



Bridge Crossing #2

Figure 49 Vet Med Connector Bridge #2 Enlargement, (by author).

CHAPTER 3

IMPLEMENTATION AND FINANCING

The original estimates for the cost of constructing the Horseshoe Bend Connector totaled just over 2 million dollars for construction and capital. This study produced a specific location for the path based on the existing topography and required grading. This provided an accurate linear foot calculation of the actual path to be constructed for each phase. For example, the phase 3 study revealed a series of switchbacks required to reach the river at acceptable gradients. The switchbacks greatly increase the linear feet of path to be constructed compared to the original estimate which was calculated using the linear feet of a straight line from point a to point b. The following estimates have been prepared for the costs of construction for paths, parking lots, and sidewalk expansions to help guide future budgeting for the three phases. Average market rates for construction of the specified materials including concrete (sidewalks), pea gravel (for the aggregate path), and asphalt (for proposed parking lots) were provided from a local landscape construction company based out of Atlanta, GA. Concrete was estimated at $5 per square foot, pea gravel was estimated at $3.50 per square foot, and asphalt was estimated at $4 per square foot (Shealey Landscape Design and Installation, 2011). It should be noted that the cost of materials can often vary based on market conditions and these numbers represent current 2011

construction costs. The following charts represent the estimated costs of construction for each of the 3 phases. The cost of plantings and site amenities were not included.

Phase I -

Cost Estimate for Constructing Proposed Path and Parking Lot

Primary Greenway Path -

3,930 Linear Feet of Path

10' Concrete Bike Lane = 39,300 Linear Feet of Concrete

39,300 l.f. x $5 per sq. ft. average = $196,500

6' Pea Gravel Pedestrian Path = 23,580 Linear Feet of Pea Gravel

23,580 l.f. x $3.50 per sq. ft. average = $82,530

Barnett Shoals Connector Path -

1,420 Linear Feet of Path

10' Concrete Bike Lane = 14,200 Linear Feet of Concrete

14,200 l.f. x $5 per sq. ft. average = $71,000

6' Pea Gravel Pedestrian Path - 8,520 Linear Feet of Pea Gravel

8,520 l.f. x $3.50 per sq. ft. average = $29,820

Barnett Shoals Commuter Access Lot -

10,000 Square Feet of Asphalt

10,000 s.f. x $4 per sq. ft. average = $40,000

Combined Totals

Concrete	**= $267,500**
Pea Gravel	**= $112,350**
Asphalt	**= $ 40,000**
Total	**= $419,850**

Figure 50 Phase I Estimates, (by author).

Phase II-

Cost Estimate for Constructing Sidewalks, Path, and Bike Lane

Research Drive -

1,525 Linear Feet of Additional Sidewalk
(10' width, along south side of roadway)
400 Linear Feet of Sidewalk to widen
(5' added width to make 10' total)
17,250 Total Linear Feet of Concrete
17,250 l.f. x $5 per sq. ft. average = $86,250

International Drive -

625 Linear Feet of Additional Sidewalk
(10' width, along east side of roadway)
875 Linear Feet of Sidewalk to widen
(5' added width to make 10' total)
10,625 Total Linear Feet of Concrete
10,625 l.f. x $5 per sq. ft. average = $53,125

ACC Easement Path -

1150 Linear Feet of Path
10' Concrete Bike Lane = 11,500 Linear Feet of Concrete
11,500 l.f. x $5 per sq. ft. average = $57,500

6' Pea Gravel Pedestrian Path = 6,900 Linear Feet of Pea Gravel
6,900 l.f. x $3.50 per sq. ft. average = $24,150

Combined Totals

Concrete = $196,875
Pea Gravel = $ 24,150

Total = $221,025

Figure 51 Phase II Estimates, (by author).

Phase III -
Cost Estimate for Constructing Proposed Path and Parking Lot

Primary Greenway Path -

6,550 Linear Feet of Path

10' Concrete Bike Lane = 65,500 Linear Feet of Concrete

65,500 l.f. x $5 per sq. ft. average = $327,500

6' Pea Gravel Pedestrian Path = 39,300 Linear Feet of Pea Gravel

39,300 l.f. x $3.50 per sq. ft. average = $137,550

Vet Med Loop and Community Access Path -

1,000 Linear Feet of Path

10' Concrete Bike Lane = 10,000 Linear Feet of Concrete

10,000 l.f. x $5 per sq. ft. average = $50,000

6' Pea Gravel Pedestrian Path - 6,000 Linear Feet of Pea Gravel

6,000 l.f. x $3.50 per sq. ft. average = $21,000

Vet Med Commuter Access Lot

10,000 Square Feet of Asphalt

10,000 s.f. x $4 per sq. ft. average = $40,000

Combined Totals

Concrete	**= $377,500**
Pea Gravel	**= $158,550**
Asphalt	**= $ 40,000**
Total	**= $576,050**

Figure 52 Phase III Estimates, (by author).

Several implementation methods have been discussed as they pertain to each phase of the greenway. A request was made in 2010 for just over 19 million dollars in SPLOST funding to finance the proposed sub projects. However, only 6 million dollars were granted in 2011, leaving a gap of 13 million dollars to complete the projects as planned (Athens-Clarke County Unified Government, 2010). The allocated SPLOST funding will implement the greenway through the Horseshoe Bend Connect only, but there are several innovative methods that have been discussed which could help finance the construction of all five sub projects. Phase I, the Horseshoe Bend

Connector, could explore the options of creating a Tax Allocation District as well as purchasing private parcels and leasing or selling them as part of a planned unit development. In phase II, existing sidewalks, which are already owned by the county, could be expanded to accommodate both bike and pedestrian traffic. In phase III, Athens-Clarke County could utilize the University of Georgia property and avoid costly land acquisition to reconnect to the Oconee River.

There have been a total of 5 proposed bridge locations identified, 3 in phase I and 2 in phase III. Each of these streams are regulated and monitored by the Georgia Department of Natural Resources. Bridge construction would encroach within their 50' buffer on either side and therefore would require the appropriate permit. Construction plans for each crossing, including the proper erosion and sediment control plans, would need to be sent to the director for review. The plans are then submitted to the U.S. Army Corps of Engineers for review which takes a minimum of 60 days. The permitting process for crossing each of these streams will take a significant amount of time and should also be factored into the budget for each phase.

CHAPTER 4

SUMMARY AND CONCLUSIONS

The North Oconee River Greenway has considerable potential to reshape the east Athens community and enhance the transportation and recreation options for surrounding area. Greenways not only protect and conserve the natural environment we live in, but they also help to promote healthier and more sustainable lifestyles for the people around them. The initial groundwork for the greenway project began almost 10 years ago, and this plan can be used to help guide future decisions regarding its implementation and funding as it continues along the North Oconee River as well as other corridors throughout the area.

An overarching goal of the North Oconee River Greenway Network is to protect riparian buffers along our streams and rivers. The preservation and conservation of riparian corridors can help to reduce the impacts of flooding in our communities. It will also improve water quality and create healthier aquatic ecosystems. Riparian areas serve as major corridors for wildlife movement and connections between habitats for animals. Establishing the greenway system will ensure that these lands are protected from development for future generations in an effort to promote a more sustainable future.

The greenway network can also benefit humans in a number of ways. Constructing trails for biking, jogging, and walking creates an opportunity for outdoor recreation and transportation, offering a break from the sedentary lifestyle most of us

live today. The trail network offers a chance to engage nature and even provides educational opportunities to learn about our natural environment. As gas prices continue to rise, people are recognizing a need for more alternative forms of transportation. Athens already has one of the most efficient public transportation systems in the state, and the North Oconee River Greenway adds one more layer to the existing transportation options.

The proposed sections of the Horseshoe Bend Connector and the Botanical Gardens Connector of the North Oconee River Greenway Network are awaiting funding to begin their implementation. Given the state of the current economy, government funding is limited, and it is necessary for planners to create innovative solutions to ensure that public projects continue moving forward.

Several solutions have been explored for the Horseshoe Bend Connector including the use of a Tax Allocation District as well as leasing and selling excess land. The creation of a planned unit development overlay district could guide development along the Horseshoe Bend Connector toward an interconnected mixed use community. The local government could then utilize existing right of way property and partner with the University of Georgia to eventually reconnect with the Oconee River minimizing the need for additional funding to purchase private property.

The proposed routes and strategies have the potential to save significant amounts of public investment and allow the project to continue moving forward while funding is limited. The continued implementation of the North Oconee River Greenway Network can help the Athens community take one step closer toward reaching a more sustainable future.

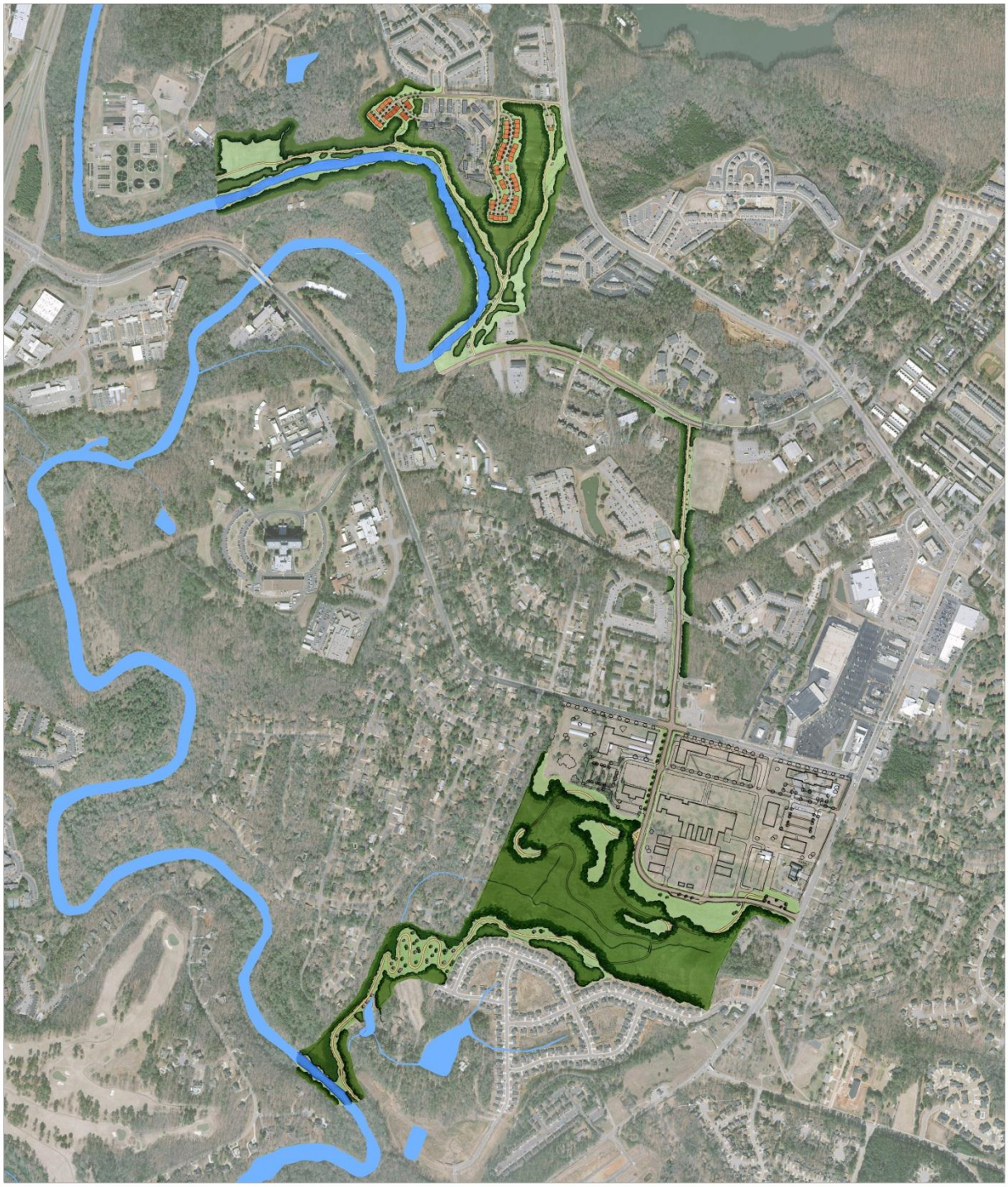


Figure 53 Conceptual Plan for All Three Phases, (by author).

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