

Chapter 4: Proposed Design

Chapter Outline:

- 1. Overview*
- 2. Final Master Plan*
- 3. Wilson Park to PH Craig Tract*
- 4. PH Craig Tract to Carolina North Forest*
- 5. Carolina North Forest*
- 6. Carolina North Forest to Claremont*
- 7. Jones Creek to Lake Hogan Farms Rd.*

1. Overview

As described in the Introduction, the goals of this planning process include providing a multi-use trail to accommodate all potential users, providing access and connectivity to Carrboro open space, parks and other Town resources, and to protect and restore wildlife habitat and water quality along Bolin Creek. The Bolin Creek Greenway will do more than simply serve as a transportation corridor; rather, it will become a destination within the Town that allows for community gathering, recreation, and education. The Bolin Creek Greenway has the opportunity to be a contiguous trail system, connecting Chapel Hill to Carrboro, and ultimately extending to Orange County. The final conceptual master plan for the Bolin Creek Greenway was generated using the following input:

- An evaluation of existing corridor conditions, opportunities, and constraints (detailed in Chapters 2 and 3)
- Work sessions with the Carrboro Greenways Commission and Town Staff
- Two Public Workshops to gather public input
- Meetings with local stakeholders and adjacent landowners

The Consultant prepared three trail alignment “alternatives” for work sessions with the Carrboro Greenways Commission and for public comment during the first public workshop. The goal of preparing three different alternatives was to provide options to the public that were distinctly different from one another so that user needs and preference, origins, and destinations could be determined. The results of the public input received during the first and second public workshop were that a combination of the alternatives would provide the greatest number of connections and benefit to residents and other trail users. The Preferred Alignment, (shown in green on the maps) is the most successful in terms of serving the largest number of neighborhoods along the corridor. Further, the Preferred Alignment provides the greatest diversity of options for accessing the trail.

In the final month of the project, the Carrboro Board of Aldermen requested the three alignments to be included on the maps in the final master plan. In this chapter and in Chapter 5: Implementation, the alternatives are shown in different colors and the design intent of each is briefly summarized in the body of the text. The alternative alignments represent various schools of thought that were used to inform the Preferred Alignment and collect public input; however, they are not intended to be “stand-alone” designs for the final conceptual plan.

2. Final Master Plan

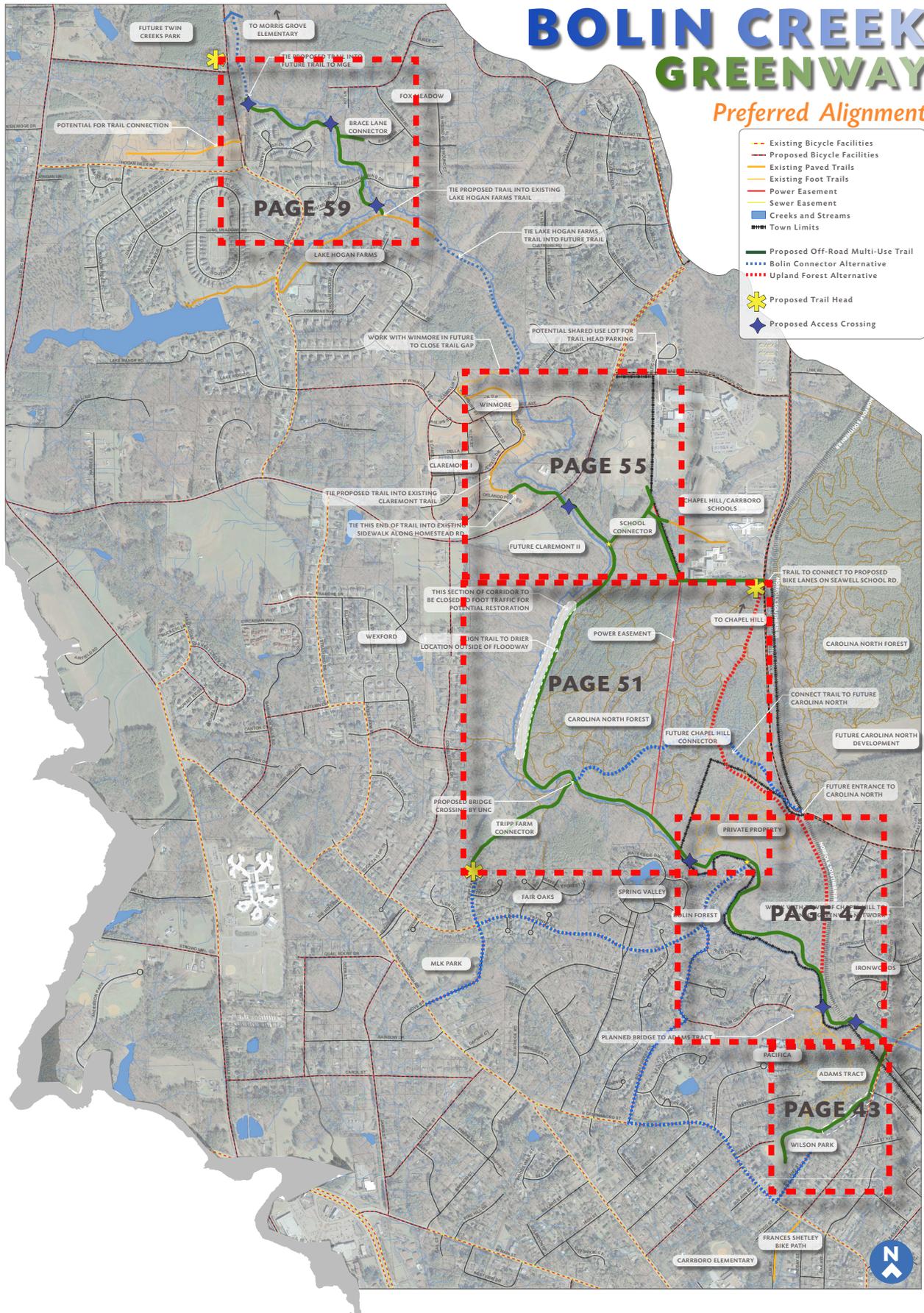
The following pages detail the recommendations for the corridor. A series of keyed maps and descriptive text provide the basis for the recommended design. Beginning at Wilson Park to the south, the corridor description moves north along the route, terminating north of Homestead Road. The corridor continues from a trail spur off the existing Lake Hogan Farms trail along Jones Creek until terminating at the end of Lake Hogan Farms Rd., near the future Twin Creeks Park. The project corridor is broken down into five sections for further analysis in this chapter. The sections are divided by the project study area as follows:

- Wilson Park to PH Craig tract
- PH Craig tract to Carolina North Forest
- Carolina North Forest
- Carolina North Forest to Claremont
- Jones Creek to Lake Hogan Farms Road

In Chapter 5: Implementation, these sections are broken down into phases and include trail surface material, amenities, budget costs, right-of-way issues and other concerns to be taken into consideration.

BOLIN CREEK GREENWAY

Preferred Alignment



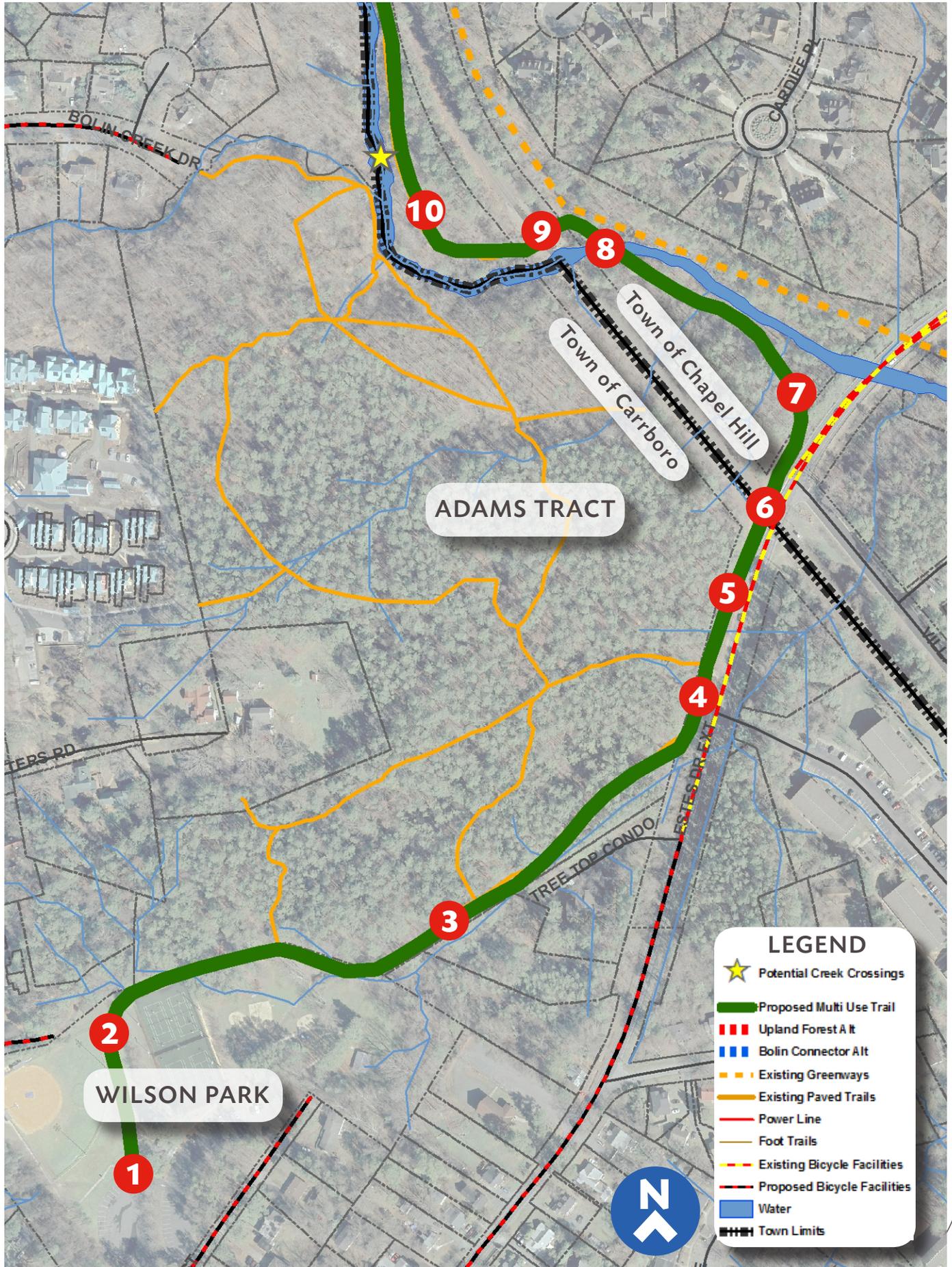
3. Wilson Park to PH Craig Tract

Wilson Park is a preferred gathering place for runners, bicyclists, walkers, and families due to its convenient location between Chapel Hill and Carrboro and its proximity to Bolin Creek. The existing park offers one ball field, tennis courts, a tot lot, picnic tables, restrooms, and parking for 100 vehicles. Proposed improvements to the park (anticipated between 2009 and 2014) include restroom building renovation and playground design. Wilson Park is an opportune location for a trailhead for the Bolin Creek Greenway.

A cleared flat corridor between the tennis courts and baseball field is well suited for trail development. An existing sewer easement continues parallel to the north side of the fields, also providing a suitable condition for a trail. Where the sewer easement runs adjacent to Adams Tract, steep grades exist and further grading studies may be necessary to determine accessibility. The Town should work with Chapel Hill to determine operations and maintenance where the alignment crosses Town boundary. Both the Carrboro Greenways Commission and the Chapel Hill Greenways Commission can work together to determine network tie-ins and develop partnerships. *(continued on page 42)*

Objectives: *(Items below can be referenced on map - see facing page)*

- 1** Utilize existing kiosks at Wilson Park to include a trail map, walking distances, and trail rules. Take advantage of and promote the use of the existing parking facilities at Wilson Park as shared trailhead parking.
- 2** Construct a 10-foot-wide concrete trail between the tennis court and ball field at Wilson Park.
- 3** Using previously allocated funds, continue the trail along the OWASA sewer easement to Estes Dr.
- 4** Provide a signalized pedestrian crossing facility at the entrance of Estes Place Apartments that will tie into the trail entrance. Work with NCDOT to install curb ramps with bollards and high visibility crosswalks.
- 5** Work closely with NCDOT to construct a 10-foot-wide concrete trail along Estes Dr. Ensure that trail construction along Estes Dr. accommodates future sidewalk construction. Install a vegetative buffer with street trees along Estes Dr. with curb and gutter while maintaining the existing paved shoulder and travel lane widths.
- 6** Work with Norfolk Southern operators to develop a safe at-grade railroad pedestrian crossing that incorporates bollards and regulatory signage, and flangeway fliers.
- 7** Work with Town of Chapel Hill and OWASA to determine maintenance, operational, and construction costs for segments that cross the jurisdictional boundaries. Coordinate with Chapel Hill proposed greenways.
- 8** Construct a low-water bridge crossing, working with federal and local agencies to obtain all necessary permits while addressing safety issues.
- 9** Design and construct a railroad underpass at the railroad trestle. Work to accommodate all owner requests regarding overhead structure design and/or alterations to all bridge members.
- 10** Obtain trail easement from PH Craig along sewer easement. Construct 10-foot-wide, concrete multi use trail.



Unapproved parking occurs along the edges of Adams Tract along Estes Dr., therefore the installation of a multi-use trail with bollards and/or vegetative buffering will likely deter future parking. The southbound paved shoulder provides a bicycle facility tie-in to the proposed trail. The Town should work with NCDOT to design and construct an approved trail intersection for both the paved shoulder tie-in and the apartment complex across the street. At a minimum, a curb ramp with bollards and a crosswalk will be necessary (see Figure 4-1), however considering the heavy traffic on Estes Dr., a High-intensity Activated crossWalk (HAWK) Signal would provide the safest crossing conditions. Both bicycles and pedestrians will need to be accommodated.

Permission will need to be obtained while designing a trail crossing for the railroad. The use of bollards, signage and flangeway fillers will provide a safe intersection for trail users that will not interfere with train operation. It is important that the trail be designed to cross the railroad at a right angle. This will prevent trail users' bicycle or wheelchair wheels from getting trapped in the rail flangeway.

Across the tracks along the sewer easement, further grading study will be necessary to determine accessibility from Estes Dr. to Bolin Creek. Near the creek, conditions flatten out along the banks. These low bank creek conditions provide an opportunity for the first low water bridge crossing. The Town should work with local and state regulatory agencies and Town of Chapel Hill to obtain necessary permits for the low water bridge. The trail continues on the north side of Bolin Creek, within sewer easement, for the majority of the proposed design. At the railroad trestle, adequate horizontal and vertical clearance is available for a trail underpass, and it will be important to work closely with rail operators to obtain permission for the trail to pass beneath (see Figure 4-2). At this point along the proposed corridor, an easement will need to be obtained from the property owner for the trail to connect to northern parts of the alignment.

Figure 4-1.



Existing conditions: Estes Dr. looking north

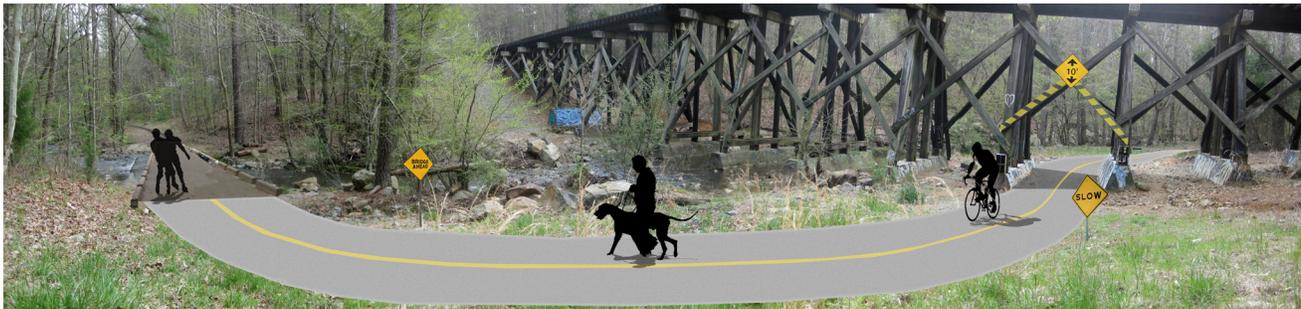


Proposed design: improvements include a multi-use trail with vegetative buffer; curb ramp for bicycle facility tie-in; and ornamental plantings

Figure 4-2.

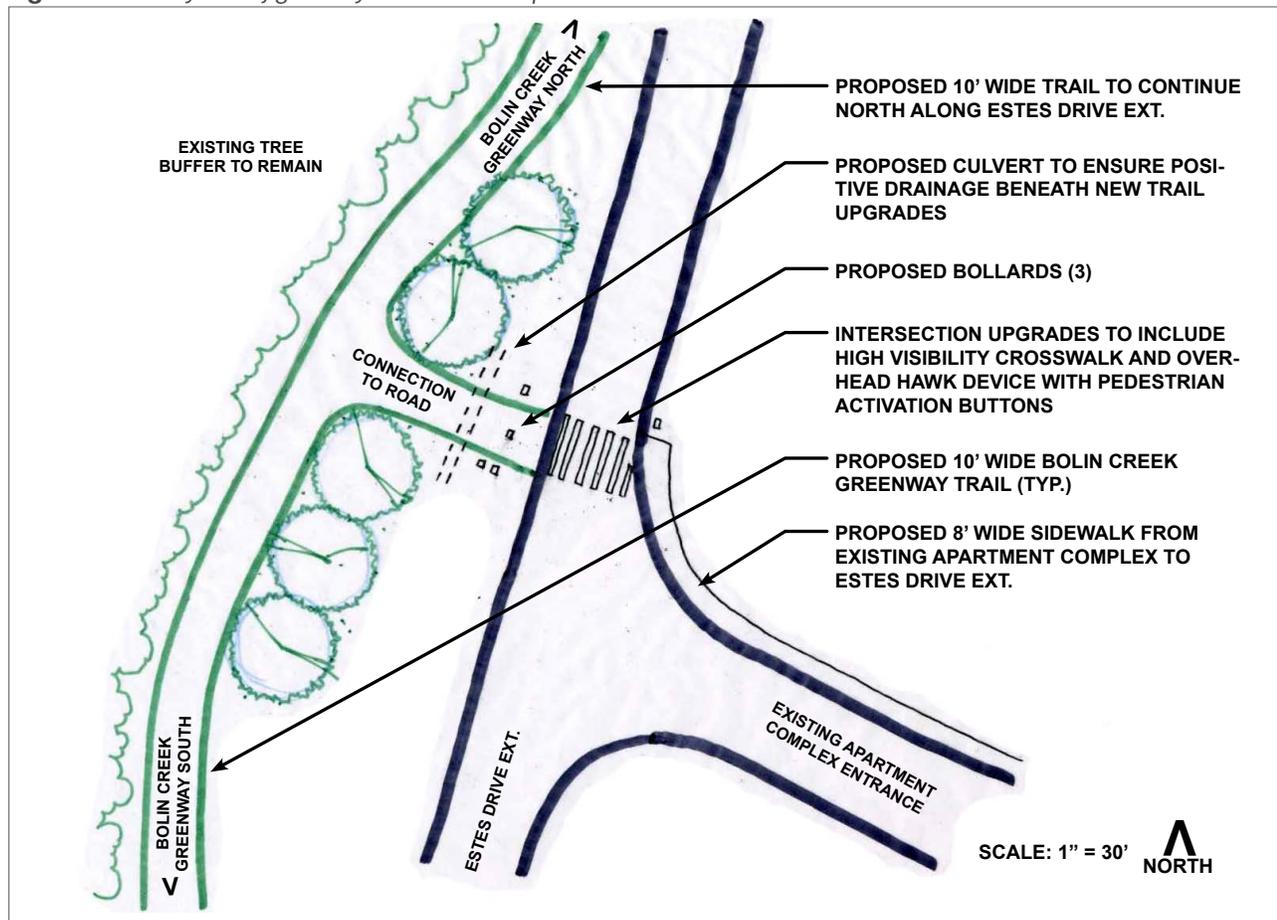


Existing conditions: Bolin Creek (left side of photo) and the Norfolk Southern railroad trestle



Proposed design: Low water bridge over Bolin Creek and trail underpass at the trestle.

Figure 4-3. Study area of greenway and Estes Dr. improvements



4. PH Craig Tract to Carolina North Forest

The large tract of land south of UNC property is privately owned. Property boundaries for the tract, known as the PH Craig property, begin just after the trail passes beneath the railroad trestle. It will be critical to acquire greenway easements on the PH Craig property in order to maintain trail connectivity. At the time permission is obtained, the trail would follow the sewer easement on the north side of Bolin Creek on the Craig property. Fencing, privacy signage and/or vegetative screening that would discourage social trails on the remainder of the Craig property are anticipated and considered necessary in order for the establishment of a public trail at this location. The Town should work to accommodate the owner's requests in order for the trail to be a publicly-operated trail facility.

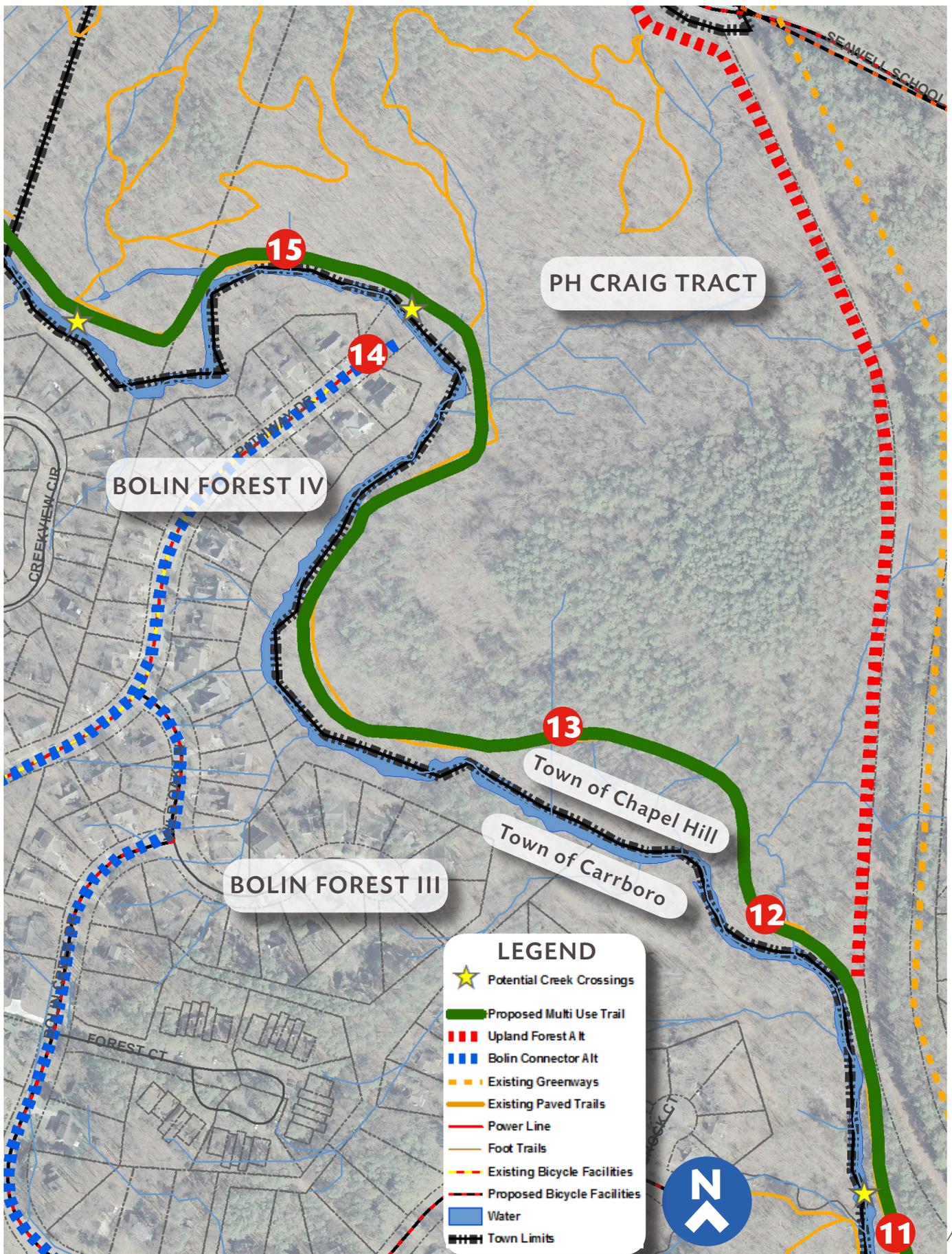
Several Bolin Creek streams traverse the PH Craig tract. Low water bridges and/or boardwalk will be necessary (see Figure 4-4) for several of the crossings, and hydraulic modeling may be warranted during the next stage of design to determine the appropriate solution for each of these crossing areas. A stream just southwest of Seawell School Road at the roadway intersection with the railroad tracks has been observed as having excellent macroinvertebrate diversity. Any stream crossing or disturbance should be pursued in recognition of this high quality aquatic habitat.

At least two single family neighborhoods, Bolin Forest III and IV and Spring Valley, abut the PH Craig tract (across Bolin Creek) and consideration should be given to serving these neighborhoods by providing a creek crossing to the proposed trail. Several potential locations for these bridge crossings, (seen as yellow stars on the map at right) were indicated by interested homeowners at public workshops. It is recommended that the Town schedule open house meetings with citizens, HOA's, and property owners during design development to determine needs and concerns if a creek crossing is proposed over Bolin Creek.

Two additional alignments have been included for the Town's consideration. The "Upland Forest," shown in red on the map, was presented at the May 2009 workshop as a greenway alternative outside the floodplain that would direct users to Seawell School Rd. The Upland Forest alternative utilizes existing trail corridors which vary in width from 18 inches to 15-feet. Some of the constraints of this alignment include steep topography, increased engineering costs, and potential ADA accessibility constraints. The Bolin Connector Alternative is shown in blue, and was presented during the May workshop as an on-road alternative that would tie into existing and proposed bicycle facilities. *(continued on page 46)*

Proposed Solution: (Items below can be referenced on map - see facing page)

- 11** Work with property owner to obtain a 4,400 linear foot (.83 mile) trail easement. Discuss owner requests such as future needs, privacy, and access issues.
- 12** Construct a 10-foot-wide concrete trail within the sewer easement. Work with OWASA to determine operational concerns.
- 13** Survey all tributary crossings and design low impact crossing solutions whenever possible. Low water bridges and boardwalk are examples of low impact solutions for tributary crossings. Obtain all necessary permits.
- 14** Meet with adjacent property owners and HOA's to determine interest for providing neighborhood access to the proposed trail. Provide several options for bridge crossings, taking into consideration proximity to private property, topography, and existing recreational use along the creek.
- 15** Begin interpretive/educational trail signage design along the trail. Opportunities include native species identification, watershed education, wildlife viewing areas, and low impact design diagrams.



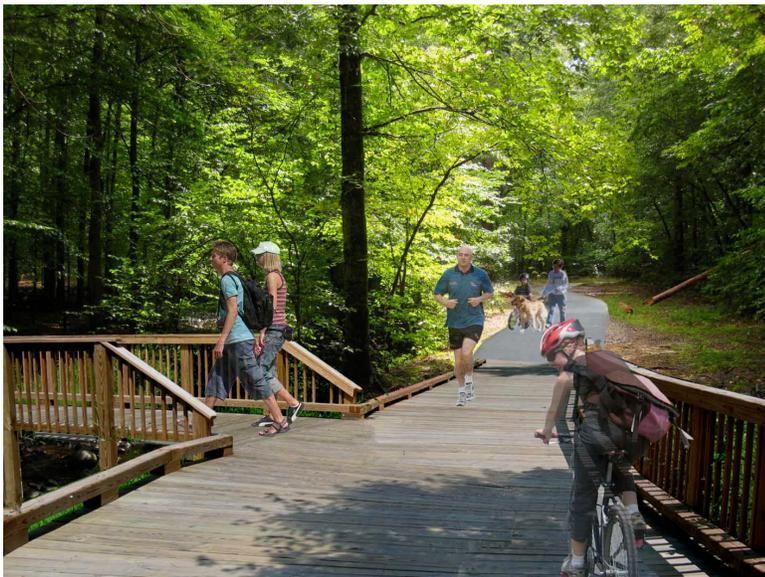
The Bolin Connector was proposed to create a “Complete Streets” concept. Challenges of the Bolin Connector, as communicated by participants of the May 2009 workshop, included concerns that many parents desired an off-road facility for their children to safely bicycle on. Additionally, making cost effective trail connections from Estes Dr. to Homestead Rd. presented engineering constraints. To read more about public input from the May 2009 workshop, see Appendix A: Public Input Summary.

The large open private property along this portion of the corridor is an important connection for the Bolin Creek Greenway. The Town should work with PH Craig to obtain an easement agreement. Trail development along this corridor would increase opportunities for local groups and clubs to develop programs and signage efforts for the trail such as wildlife observation, bird watching, and walking classrooms. Encourage use along the trail by holding fundraisers or Town events on the greenway to establish interest. See Appendix C: Operations and Management for more ideas about trail programming.

Figure 4-4.



Existing conditions: stream crossings along the corridor are not safe for proposed trail use. Exposed sewer mains (seen at right) and rip rap present hazards.



Proposed design: providing elevated boardwalk bridges over intersecting streams will allow for wildlife viewing platforms and provide a high and dry solution for trail users.

5. Carolina North Forest

The Carolina North Forest, a popular recreational destination in Carrboro and Chapel Hill, is a 750-acre tract of open space with many miles of trails and wooded forest. In Carrboro, the Carolina North Forest makes up 304 acres. Nearly 60 percent of the Bolin Creek Greenway alignment is proposed in the Carolina North Forest. The development of a trail across UNC property is and will continue to be a collaborative effort between the Town of Carrboro, the Town of Chapel Hill, OWASA, and UNC. During the planning process, Town staff and the consultant worked closely with representatives of Carolina North Forest (UNC) to determine operational issues, forest and land management needs, maintenance concerns, and trail funding, and their comments have been incorporated into this section.

The Carolina North Forest segment is very important to the proposed Bolin Creek Greenway because it has the most potential to connect a multitude of destinations in Carrboro. The Carolina North Forest is surrounded by neighborhoods and schools. With the exception of Seawell School Rd. and Old 86, there is no direct north/south connection to northern parts of Carrboro. If constructed, the proposed greenway would permit elementary, middle, and high school students to safely walk or bike to school who live in Ironwoods, Bolin Forest I, II, III and IV, the Cedars, Pacifica, Estes Park Apartments, Spring Valley, Quarterpath Trace, Fair Oaks, Cobblestone, Cates Farm, Barrington Hills, Wexford, and Carolina Commons, a currently proposed UNC housing development. Additionally, users would no longer be challenged by traffic conditions on Homestead Rd.

The existing sewer easement located along Bolin Creek through Carolina North Forest is and has been used for years by Carrboro citizens as a recreational corridor. Foot and bicycle traffic as well as utility vehicles have caused a significant degree of compaction along the surface, while erosion has caused further problems along the easement where rutting is evident. The greatest concern is in areas of the easement where overuse and surface disturbance has caused *trail braiding* to occur. After storm events, wet surface conditions create pocket areas of the corridor which remain muddy and inundated. As users bike, walk, and jog along the wet surface, efforts are made to avoid these wet and muddy areas, and seek the “high and dry” path of travel, thereby widening the corridor and creating what is known as trail braiding. Over time, trail braiding can widen corridors to up to 50-feet or more, impacting portions of the understory and otherwise areas that were not intended for foot traffic. The continuous disturbance of sediment increases runoff into streams, which contributes to further pollution of Bolin Creek. By providing a hardened surface, the user is confined to a ten-foot-wide route which minimizes social trails and trail braiding along the corridor and maintains the intended route of travel provided by the trail tread. Further, a hardened surface can be used by all groups including persons in wheelchairs. The final determination of the surfacing material will be determined by UNC.

Some public workshop attendants expressed concerns about wildlife and/or environmental impact that may be associated with trail development within the Carolina North Forest. The Bolin Creek Greenway, if constructed, has the potential to enhance, restore and further protect the natural resources found along Bolin Creek. The Carolina North Forest is a valuable natural resource; however it is surrounded by significant amounts of urban and suburban development. It is recommended that the Town attempt to accommodate the use of the corridor within Carolina North Forest by constructing a safe trail facility that can withstand high amounts of human traffic, will mitigate erosion that is already occurring along the corridor, and provide an environment where wildlife and human use can cohabit.

The Town should give strong consideration to meeting with OWASA and UNC representatives to discuss any relocation projects for sanitary sewer mains that run north/south along Bolin Creek through Carolina North Forest. The relocation of mains east of their existing location outside of the floodway would provide opportunities along the old easement for environmental restoration. Currently, there are at least six tributaries intersecting the easement. The existing sewer easement would be closed to foot traffic once the new corridor

is complete. If the sewer line were relocated, riparian restoration could be pursued, and the possibility of allowing a beaver colony to become established could also be considered, which could have the potential for a number of environmental benefits, including water quality improvement, wildlife habitat, and privet control. The proximity to schools could enable this to be a prime educational field site.

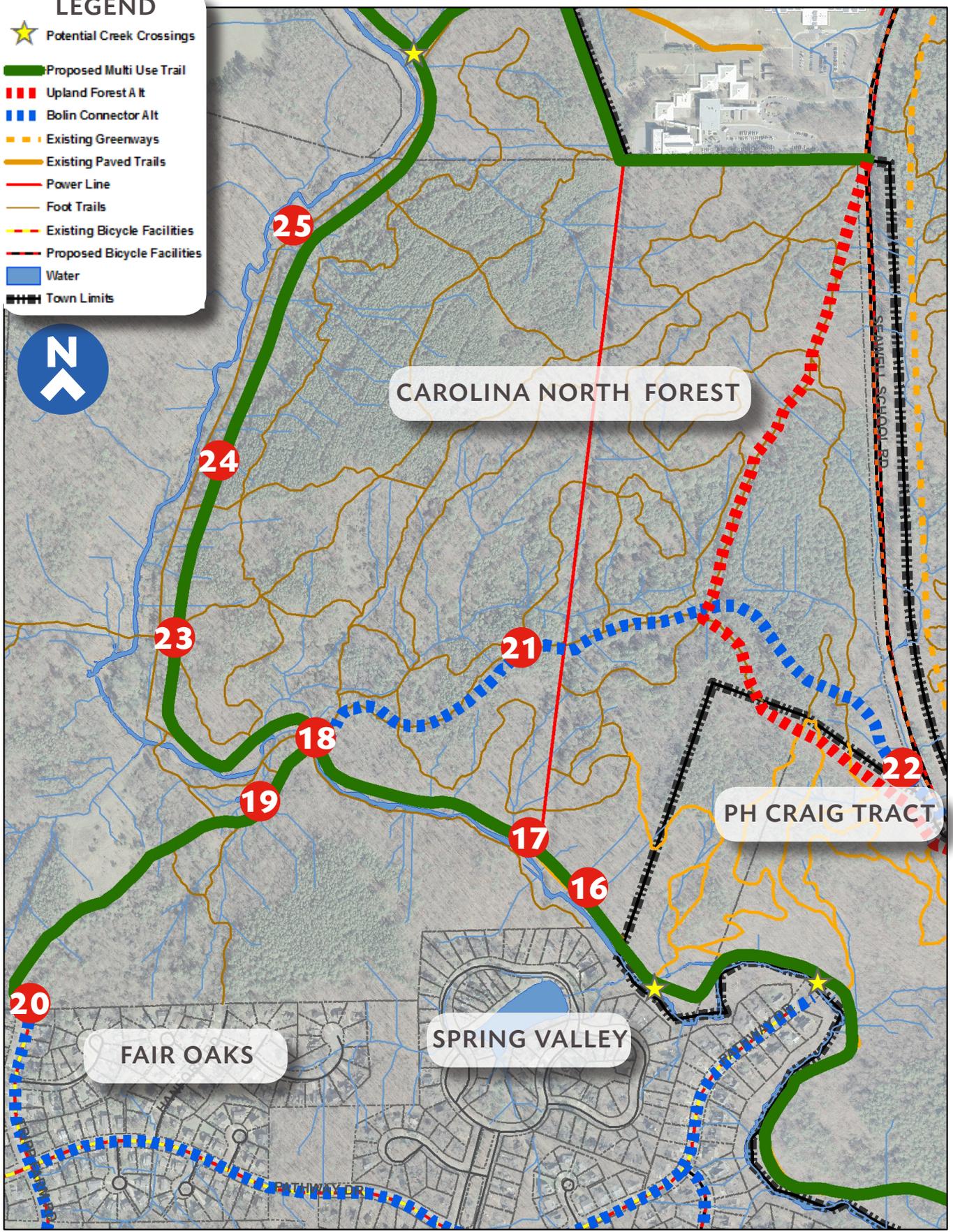
Opportunities for lateral connections exist within Carolina North Forest, linking Spring Valley and Wexford neighborhoods in the west and Seawell School Rd. to the future Carolina North Development in the east. These lateral connections are valuable with respect to future developments such as Carolina North, and Chapel Hill's future greenways and will be determined by UNC. An example of the relationship of this multi-solution alignment can be seen in Figure 4-5. The flat semi-open area at the end of Tripp Farm Rd. is well suited for a small trailhead. The Town should work with adjacent property owners and HOA's as well as UNC to determine trailhead feasibility at this location (see Figure 4-6 and 4-7). A gravel service road continues east on UNC property just before the location for a future pedestrian bridge crossing over Bolin Creek. Once the bridge is installed, there is potential for the proposed Bolin Creek Greenway to utilize this crossing to link users to Tripp Farm Rd. The Town should coordinate the construction plans of the bridge crossing with the construction drawings of the proposed trail, as well as all signage and trail construction plans with UNC. *(continued on page 50)*

Proposed Solution: (Items below can be referenced on map - see next few pages)

- 16** Obtain easement agreement for all trail corridors on UNC property. UNC has determined it will be responsible for all maintenance and management of proposed trail on UNC property.
- 17** Construct a 10-foot-wide trail "main line" along Bolin Creek. Work with UNC to determine exact materials and finishes.
- 18** Work with UNC during bridge construction to ensure that the proposed trail can tie into future bridge crossing.
- 19** Construct a paved trail along gravel service road to establish a lateral connection to Tripp Farm Rd.
- 20** Using the existing flat open area at the end of Tripp Farm Rd., work with adjacent homeowners and UNC to construct a small trailhead that can accommodate up to 15 cars. Incorporate a kiosk with trail signage and rules.
- 21** Establish an eastern connector to Seawell School Rd. by constructing a gravel trail along the service road that will connect to future Carolina North development. Work closely with UNC to determine alignment.
- 22** Develop wayfinding signage along the trail that directs users to future Carolina North development, working closely with UNC.
- 23** Work with OWASA to monitor future sewer main line relocation projects. In the event that sewer easements are relocated, these corridors are opportunities for trail development.
- 24** If and when the new sewer line is installed by OWASA, construct 10-foot-wide concrete trail within the corridor. Establish native plantings to restabilize the soils.
- 25** Allow the previous sewer easement to return to a natural state, by installing native species and removing invasive species, creating a vegetative buffer that will support wildlife habitat and stabilize soils located in the floodway.

LEGEND

- ★ Potential Creek Crossings
- Proposed Multi Use Trail
- Upland Forest Alt
- Bolin Connector Alt
- Existing Greenways
- Existing Paved Trails
- Power Line
- Foot Trails
- Existing Bicycle Facilities
- Proposed Bicycle Facilities
- Water
- Town Limits



Two additional alignments have been included for the Town’s consideration. The “Upland Forest,” shown in red on the map, was presented at the May 2009 workshop as a greenway alternative outside the floodplain that would direct users to Seawell School Rd. The Upland Forest alternative utilizes existing trail corridors which vary in width from 18 inches to 15-feet. Some of the constraints of this alternative include steep topography, increased engineering costs, and potential ADA accessibility constraints. The Bolin Connector Alternative is shown in blue, and was presented during the May workshop as an on-road alternative that would tie into existing and proposed bicycle facilities. The Bolin Connector was proposed to create a “Complete Streets” concept. Challenges of the Bolin Connector, as communicated by participants of the May 2009 workshop, included concerns that many parents desired an off-road facility for their children to safely bicycle on. Additionally, making cost effective trail connections from Estes Dr. to Homestead Rd. presented engineering constraints. To read more about public input from the May 2009 workshop, see Appendix A: Public Input Summary.

Trail connections to Seawell School Rd. would provide links to existing and proposed bicycle facilities. Access to Carolina North Forest from Seawell School Rd. is currently limited to a gated entry and gravel shoulder. The construction of a more formal trailhead area would allow safe parking options and would prevent users from parking on Chapel Hill Carrboro City Schools (CHCCS) property during school hours. In addition, the Town could work with CHCCS to take advantage of shared parking on weekends and after school hours in the parking lots provided at the elementary school. The gravel access road near Dry Gulch that begins at Seawell School Rd. and terminates at Bolin Creek would provide a feasible cleared corridor and offers a direct connection to the main “spine” of the Bolin Creek Greenway along the creek.

The opportunity for trail development along the existing power easement through Carolina North Forest was considered. In the field, it was determined that surrounding trail traffic, surface conditions, topography, and potential user conflict from adjacent mountain bike trails is not conducive to trail development along the power easement. According to Duke Energy transmission rights-of-way restrictions, “streets, roads, driveways, sewer lines, water lines, and other utility lines, or any underground facilities shall not parallel the centerline within the rights of way, but may cross, from one side to the other, at any angle not less than 30 degrees with the centerline. No portion of such facility shall be located within 25 feet of Duke Energy’s supporting structures.” In order to comply with Duke’s restrictions, additional tree clearing would be necessary along the easement.

Figure 4-5.



This section shows proposed conditions in the Carolina North Forest. Carrboro citizens indicated a preference for both a creekside trail as well as an upland connection to Seawell School Rd.

Figure 4-6.



Existing conditions: entrance to Carolina North Forest near gravel area at end of Tripp Farm Rd.



Proposed design: adequate space is available to accommodate a small trailhead with informational kiosks and several cars.

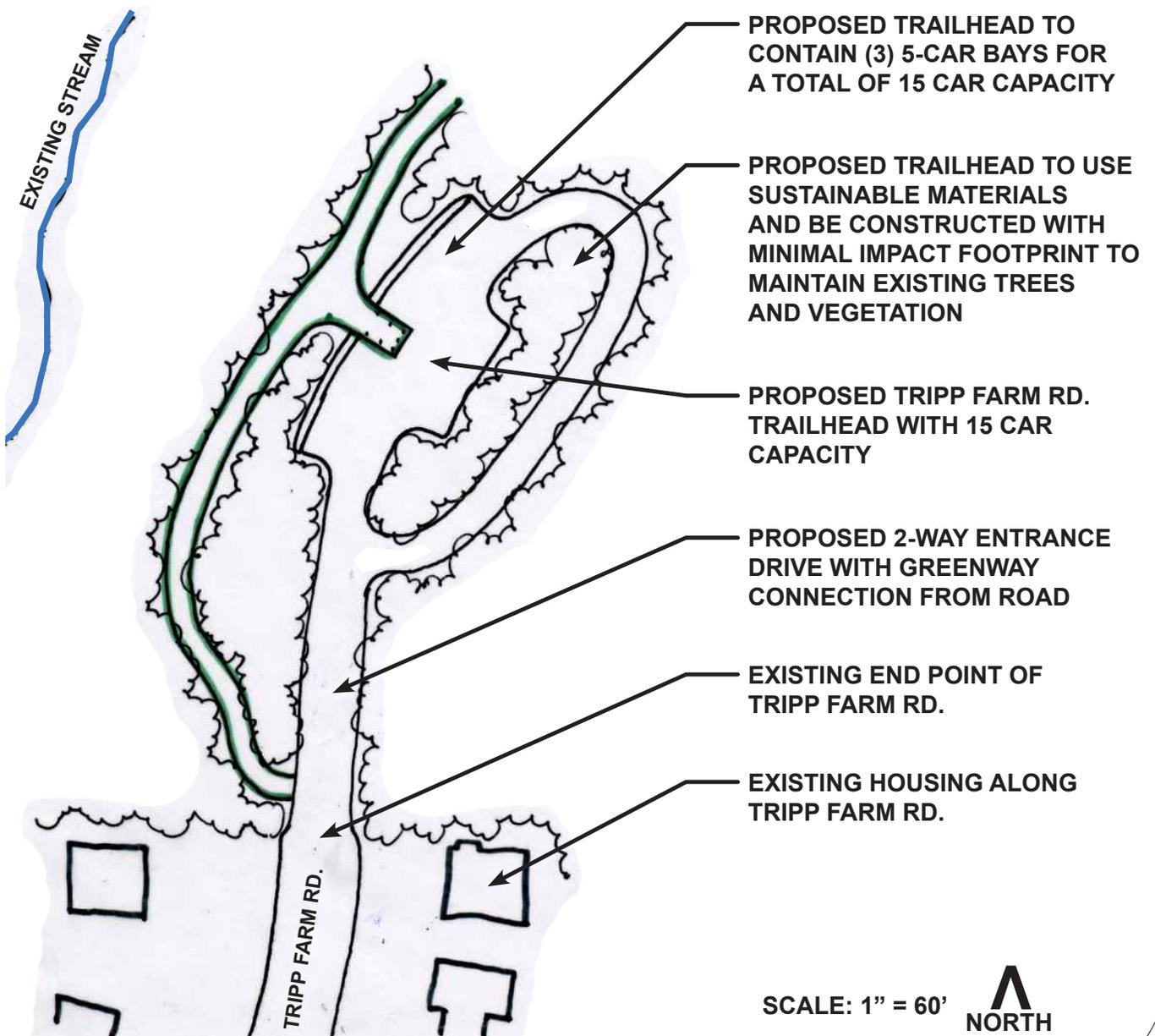


Figure 4-7. Enlargement of proposed trailhead at end of Tripp Farm Rd.

6. Carolina North Forest to Claremont

North of Carolina North Forest, the Bolin Creek Greenway continues through State of North Carolina-owned property along the sewer easement. A lateral sewer easement that travels east to the CHCCS property is well suited for a connecting spur, which should tie into the existing paved trails on campus property. The CHCCS connector shown on the following page is one of several possible alignments for this section of the trail. A final alignment will be determined through dialogue with UNC and consideration of safety for CHCCS students and other potential trail users, route efficiency, and the extent of vegetation clearing required. (See Chapter 5: Implementation for a map of potential alignment alternatives for this connector.) Work with CHCCS to develop a safe connection by determining security needs, maintenance, and signage issues. Wayfinding signage will be particularly important in this area for young children and other trail users. The Town should develop a partnership with the state that permits trail development on state-owned property.

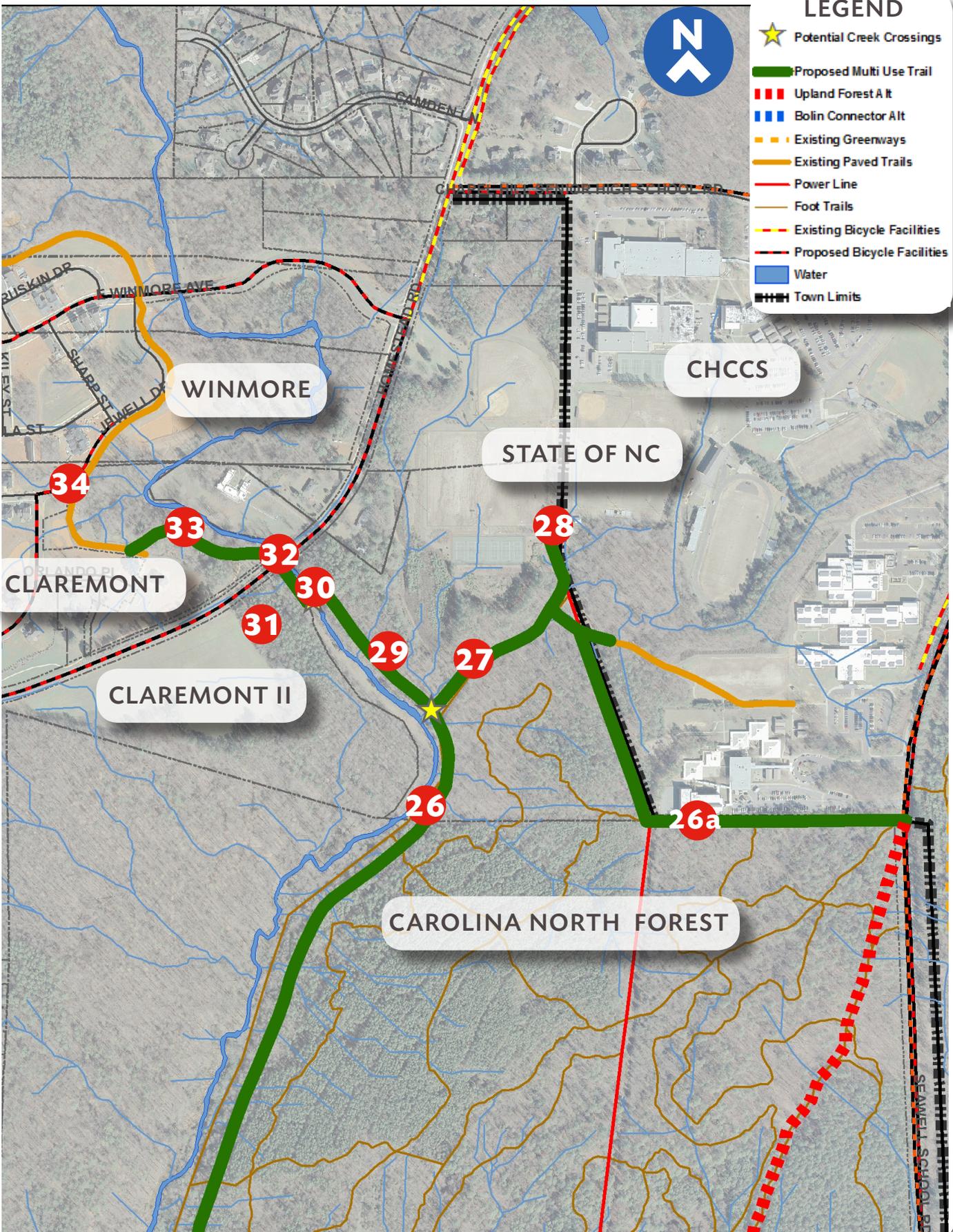
Future housing is proposed for Claremont II west of Bolin Creek and across from state-owned property. Plans include mixed density housing, sidewalks, and a multi-use path. During the planning process, project plans were obtained to determine the location for a creek crossing that would connect to the development and minimize impact to the corridor. Based on existing floodway bridge span requirements, existing topography, and future facility tie-in opportunities, the proposed alignment continues north along state-owned property and crosses Bolin Creek approximately 200 feet south of Homestead Rd. Efforts should be made to avoid removing as many trees as possible along this section of the corridor which does not align with the existing sewer easement. *(continued on page 54)*

Proposed Solution: *(Items below can be referenced on map - see facing page)*

- 26** Obtain a greenway easement along state-owned property for the trail. Construct a 10-foot-wide, concrete trail.
- 27** Utilizing the existing sewer easement, construct a 10-foot-wide concrete trail spur to CHCCS property.
- 28** Work with CHCCS to tie proposed Bolin Creek Greenway into campus network. Install wayfinding and regulatory signage, security screening, and other land owner requests along the spur.
- 29** Clear trail corridor and continue the 10-foot-wide concrete trail along the east side of Bolin Creek, avoiding the removal of as many trees as possible.
- 30** Work with an engineering consultant to design, fabricate, and install a safe and accessible bridge crossing over Bolin Creek. Determine the lowest impact design that will span the floodway.
- 31** Work with Claremont developers to implement trail connections at Claremont per conditions of their land use permit. Develop wayfinding signage for nearby trail connections as well.
- 32** Construct a trail underpass beneath Homestead Rd. Work closely to obtain approval from NCDOT. Include regulatory signage and any other NCDOT requests.
- 33** Secure a greenway easement along the eastern portion of Claremont I. Construct concrete trail with retaining walls and regulatory signage. Avoid the removal of as many trees as possible.
- 34** Connect the proposed greenway to the existing trail at Claremont neighborhood. Work with developers to introduce neighborhood signage or a kiosk that includes a trail map and rules.

LEGEND

-  Potential Creek Crossings
-  Proposed Multi Use Trail
-  Upland Forest Alt
-  Bolin Connector Alt
-  Existing Greenways
-  Existing Paved Trails
-  Power Line
-  Foot Trails
-  Existing Bicycle Facilities
-  Proposed Bicycle Facilities
-  Water
-  Town Limits



An additional alignment has been included for the Town’s consideration. The “Upland Forest,” shown in red on the map (page 55), was presented at the May 2009 workshop as a greenway alternative outside the floodplain that would direct users to Seawell School Rd. The Upland Forest alternative utilizes existing trail corridors which vary in width from 18 inches to 15-feet. Some of the constraints of this alternative include steep topography, increased engineering costs, and potential ADA accessibility constraints.

The proposed pedestrian bridge over Bolin Creek near Homestead Rd. is only one of two proposed bridge crossings across the creek. Depending on hydraulic and geotechnical studies, the bridge will likely span up to 150-feet and will require handrail. Further analysis will be required for the design of the proposed pedestrian bridge.

Traffic conditions along Homestead Rd. were examined in the field. Site lines, topography, traffic volumes, and vehicle speeds confirmed that an at-grade crossing would not be suitable for the proposed greenway. Beneath Homestead Rd., however, conditions are favorable for a trail underpass (see Figure 4-8). Ample vertical and horizontal clearance will permit a 10-foot wide trail with a small retaining wall on the west bank of Bolin Creek (see Figure 4-9). Conditions are less favorable for trail development on the east side of the creek. Preliminary evaluations of possible hydraulic impacts by PBS&J determined that the east side underpass presented a greater impact to Bolin Creek and would require fill dirt within the floodway. This condition, coupled with adjacent private property and topography, confirmed the western alignment of the trail beneath Homestead Rd.

North of Homestead Rd., the trail will require a retaining wall south of Claremont. Town staff and the consultant worked with developers of Claremont, the adjacent single family neighborhood, to determine a location for a connection to the neighborhood’s existing greenway (see Figure 4-10). Topography along Bolin Creek in this area is steep and in order for the trail to meet accessibility requirements, the proposed Bolin Creek Greenway will make its connection behind the clubhouse in Claremont. Efforts should be made during design development to avoid removing as many trees as possible.



Existing conditions: sewer easement paralleling Bolin Creek beneath Homestead Rd.



Figure 4-8. Proposed design: adequate horizontal and vertical clearance beneath Homestead Rd. will allow a safe roadway alternative to crossing at grade.

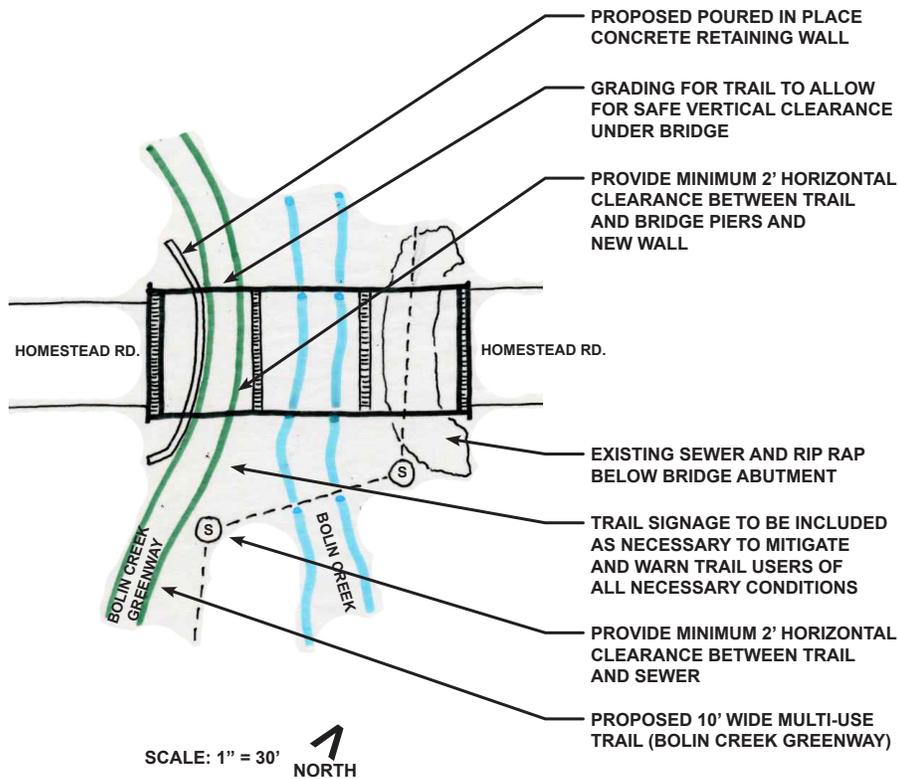


Figure 4-9. Enlargement of the Homestead Rd. trail underpass.

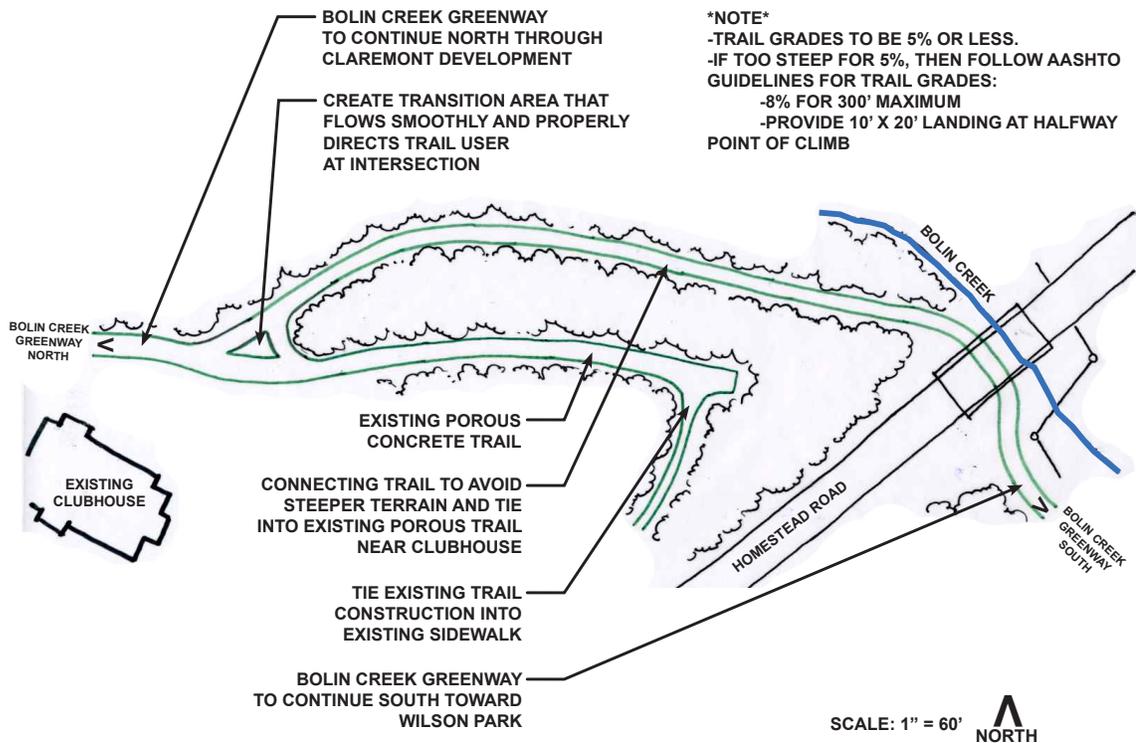


Figure 4-10. Enlargement of trail conditions at Homestead Rd. and the proposed trail tie-in at Claremont.

7. Jones Creek to Lake Hogan Farms Rd.

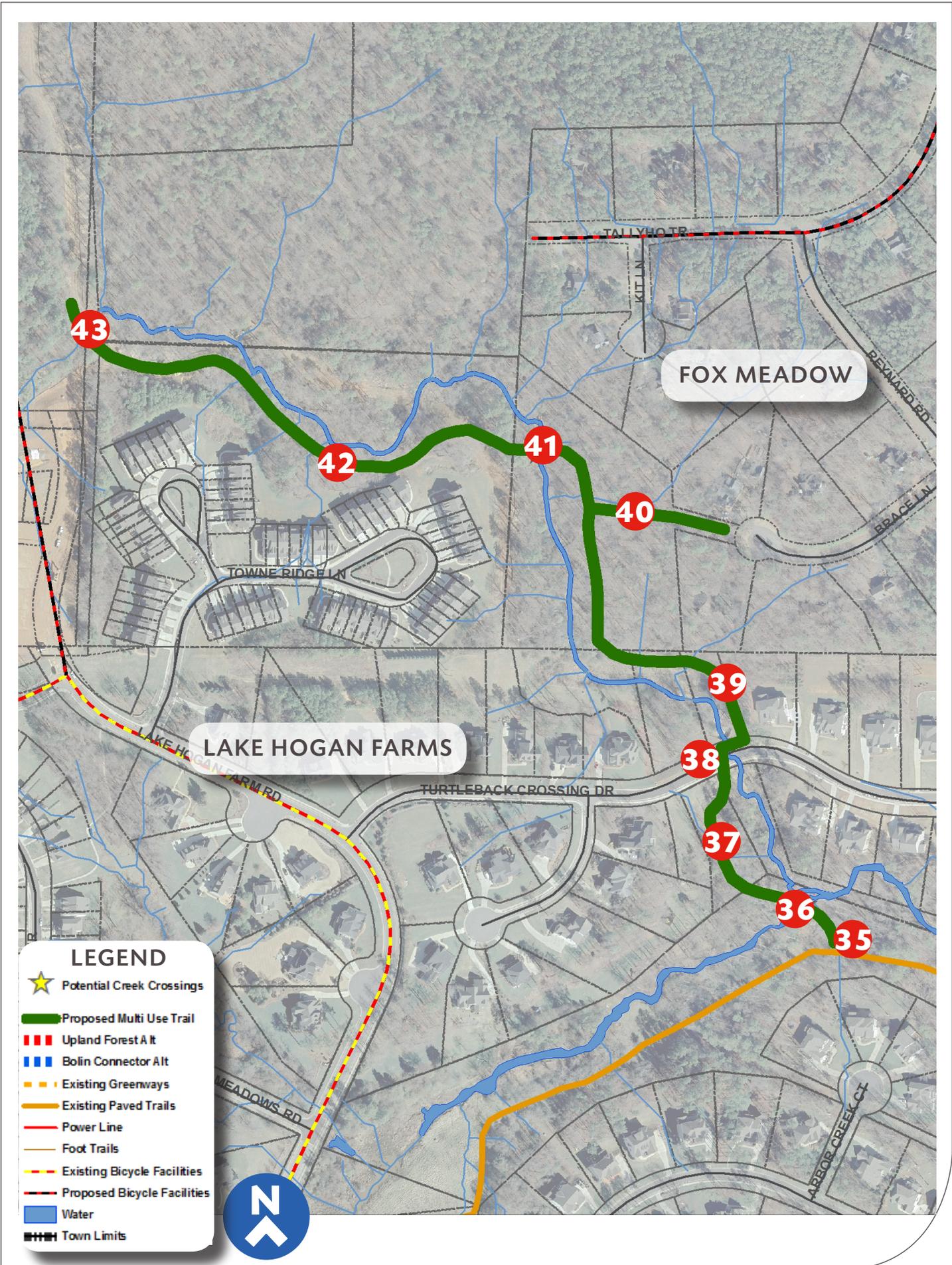
Jones Creek is unique to the Bolin Creek Greenway because it closes a gap that will provide continuity with the future trail connecting Morris Grove Elementary to Twin Creeks Park and southern parts of the Bolin Creek Greenway. Cooperation will be necessary from the Lake Hogan Farms (LHF) HOA for nearly all aspects of the alignment. LHF existing multi-use trail extends from the neighborhood lake east to UNC property, and parallels the sewer easement. Opportunity exists to provide a northern spur off the LHF trail within OWASA right-of-way, as several parcels exist along the corridor that are suited for trail development. A pedestrian bridge crossing will be necessary just south of the confluence of Bolin and Jones Creek to maintain the flexibility of available lands, and the Town should work to organize a meeting with both LHF HOA and OWASA to discuss trail development within these areas, respectively.

Topographical challenges exist at Turtleback Crossing Dr. The potential for a trail underpass beneath Turtleback Crossing was ruled out due to the presence of double box culverts beneath the roadway and costs associated with such engineering. Because Turtleback Crossing Dr. is a local residential road, an at-grade crossing is feasible with some minor adjustments to accommodate the width of the trail. See Figure 4-11 for the proposed at-grade crossing solution.

When working with LHF to obtain greenway easements within all LHF HOA parcels, consider privacy and security issues for adjacent homeowners. A substantial amount of clearing will be necessary along parts of the Jones Creek corridor because opportunity to take advantage of sewer easement (previously cleared corridors) on public property is limited. *(continued on page 58)*

Proposed Solution: *(Items below can be referenced on map - see facing page)*

- 35** Meet with LHF HOA to determine trail connection feasibility. Acquire greenway easements within LHF HOA parcels.
- 36** Design a low-flow, low water bridge across Bolin Creek (south of the confluence) that will connect the trail to OWASA property.
- 37** Work to obtain greenway easements along OWASA property. Construct 10-foot-wide concrete trail along Jones Creek.
- 38** Construct an at-grade crossing with low retaining walls, signage, and a crosswalk. See Figure 4.9 for further detail.
- 39** Arrange a meeting with all adjacent homeowners to determine privacy and screening concerns.
- 40** Provide a trail spur that connects the greenway to the Fox Meadow neighborhood. Meet with homeowners that live on the cul-de-sac on Brace Ln. to determine any potential concerns.
- 41** Construct a bridge crossing over Jones Creek on county property. Meet with officials to discuss partnerships for trail development on county property.
- 42** Meet with town home owners in Towne Ridge Ln. to discuss the proposed design. Determine privacy issues and accommodate any screening requests.
- 43** Design a low water bridge over Buckhorn Branch that will permit the trail to continue along the sewer easement northward, connecting with the future trail to Morris Grove Elementary School.



The Town should meet with Orange County to ensure a partnership for trail development between Orange County and the Town of Carrboro. Orange County property is well suited for trail development along the low banks of Jones Creek. Also proposed on county land is a connection to Brace Ln. Public workshop participants expressed an interest in a trail spur at this location, which will serve the Fox Meadow neighborhood. A grading study may be necessary when connecting to Brace Ln. to determine accessibility calculations. A low water bridge crossing is proposed on Orange County property. This crossing location provides adequate space on either side of the creek banks, while remaining on county property. Extending west, the proposed trail follows sewer easement corridors behind the town homes in Town Ridge Ln. Space is limited between the town home lots and Jones Creek. The Town should meet with adjacent property owners and the HOA to determine privacy and security concerns. Vegetative screening and opaque fencing are potential solutions for this area (see Figure 4-12).

Buckhorn Branch (a tributary of Jones Creek) necessitates a bridge crossing as the trail extends northward. A low water bridge would permit the greenway to utilize the sanitary sewer easement and tie into the future trail which is planned to begin at the proposed Twin Creeks Park and extend to Morris Grove Elementary.

Figure 4-12.



Existing conditions: the sewer easement behind Lake Hogan Farms town homes provides a cleared corridor well suited for trail development; however it is in close proximity to the town homes.



Proposed design: Opaque fencing and/or vegetative screening will help increase privacy and establish a clear delineation of what is privately owned and public property.

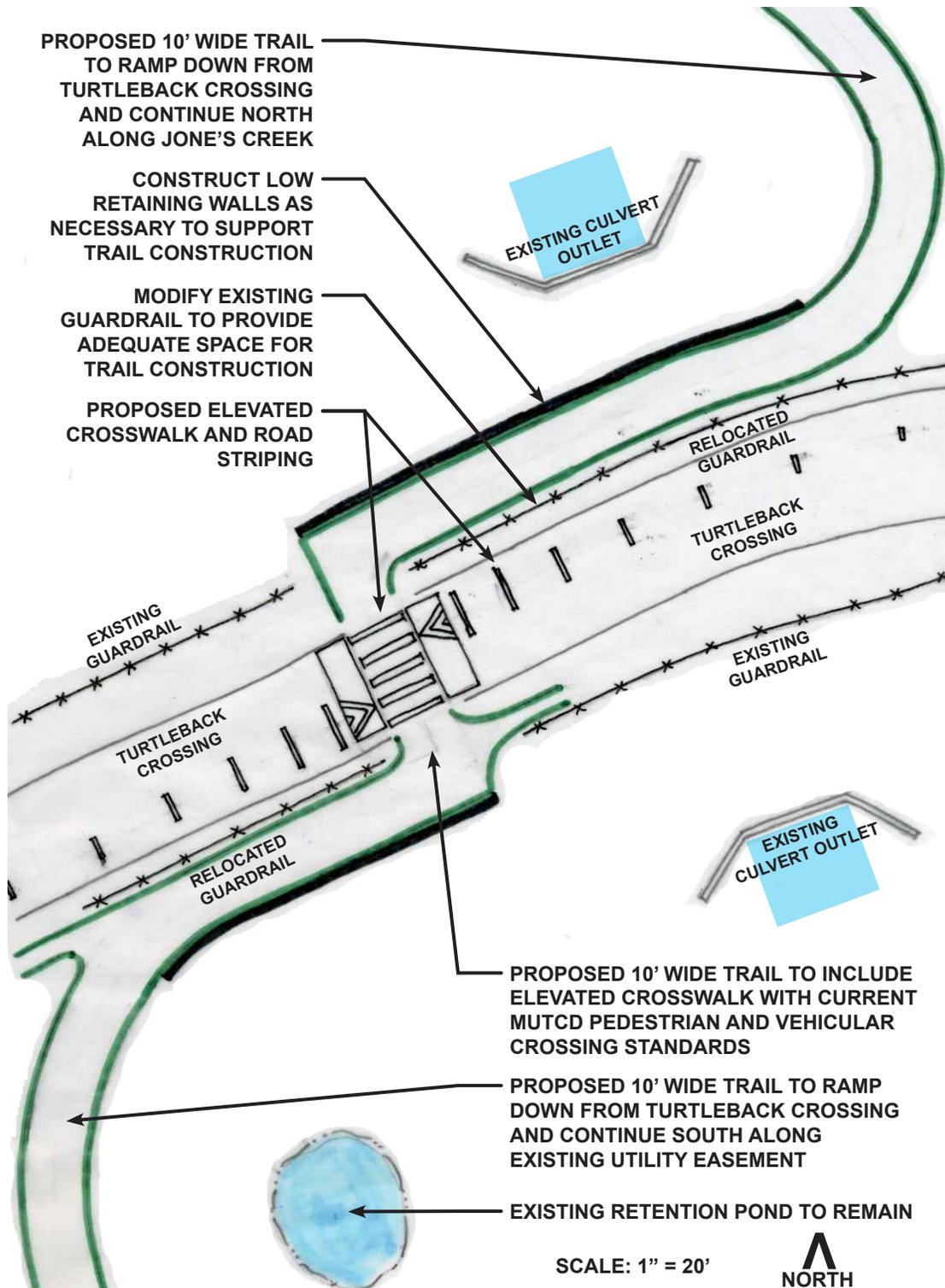


Figure 4-11. Study of the at-grade crossing at Turtleback Crossing Rd.

References:

Carolina North Website:

<http://www.fac.unc.edu/AboutUs/ShopsDepartments/Grounds/CarolinaNorth/tab-id/259/Default.aspx>

Information on HAWK signals:

http://www.saferoutesinfo.org/guide/case_studies/case_study.cfm?CS_ID=CS651&CHAPTER_ID=C353

Future UNC Carolina Commons Development:

<http://www.unc.edu/community/carolinacommons.html>

Duke Energy Rights-of-way Restrictions:

<http://www.duke-energy.com/safety/right-of-way-management/transmission-restrictions.asp>

Carrboro Recreation and Parks Master Plan:

<http://www.ci.carrboro.nc.us/RP/PDFs/APPROVEDMASTERPLAN.pdf>