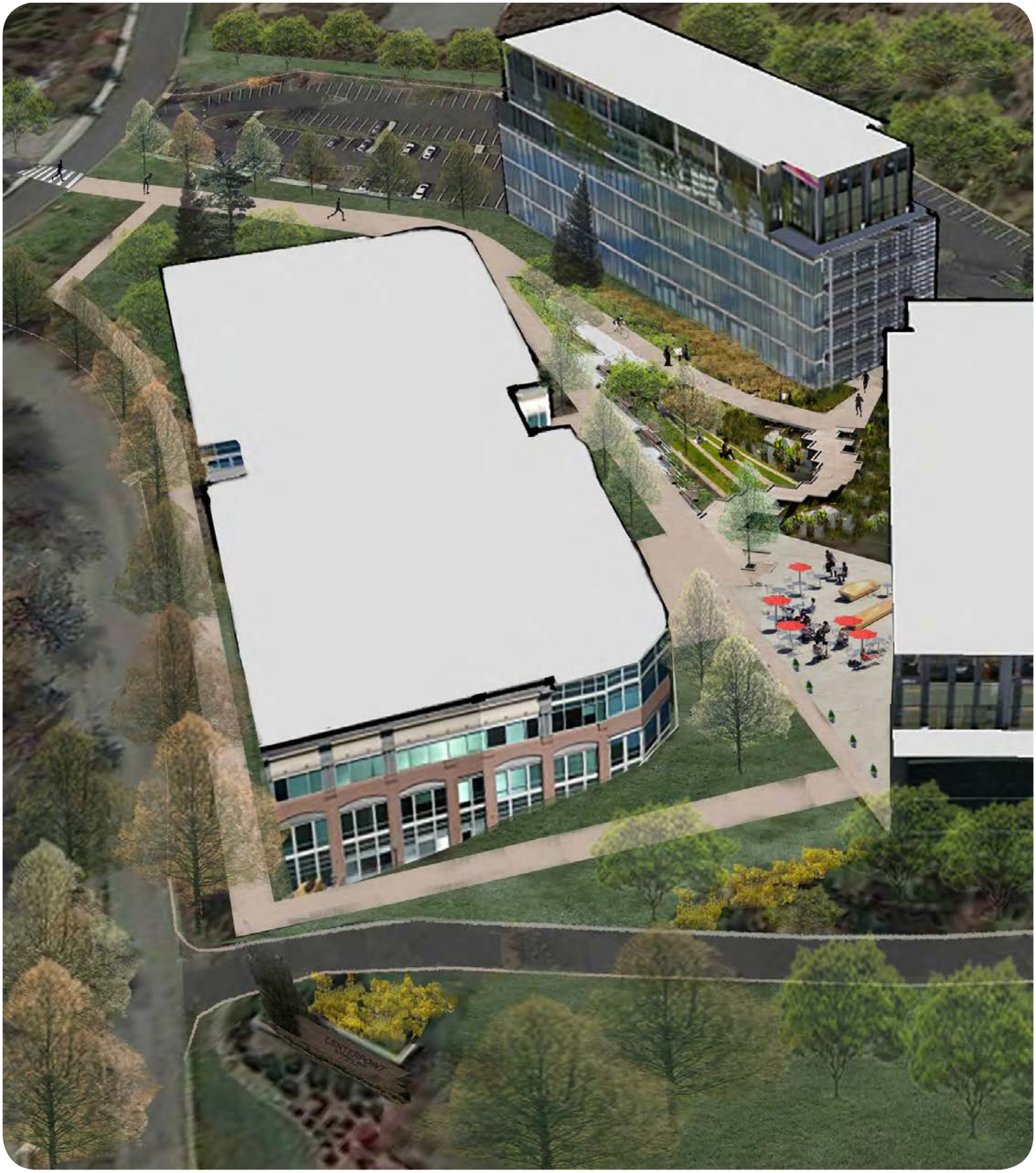
Section III

Corridor Design



Section III
Corridor Design

Introduction

The Greenway Vision

The vision for this greenway is much more than a linear path. The greenway has potential to connect neighborhoods, to link children to schools, and to bring users to the natural world. It can be key to improving the mental and physical health of residents and workers and be a means of transportation for work and play. Perhaps its greatest potential is to be a major draw of the Technology Corridor, attracting businesses that are drawn to relocate, in part, because of it. The vision is of office parks and campuses that incorporate open space and internal trail systems connecting to the greenway as part of their design. This vision provides opportunities for whole office complexes to have an opportunity for increased health and productivity, for bike commuters to utilize the system to get to work, and for reduced motor vehicle traffic because of increased greenway use for transportation. This vision promotes the redevelopment of the Solway area surrounding Melton Hill Lake, creating a more vibrant, walkable commercial experience that is oriented toward the Lake and connects to Melton Lake Greenway, Haw Ridge, the UT Arboretum, and Oak Ridge.

This vision sets defining principles that drive corridor design. Existing site conditions, opportunities, constraints, and input from the Technical Advisory Committee and public all have informed the corridor design recommendations.

Design Principles of the Greenway

Below are guiding principles to design the preferred and alternative greenway corridors:

Connect Infrastructure, Connect People. Greenways can serve as major arterials for human-powered transportation. These arterials should have pedestrian/ bicycle infrastructure radiating from them, serving to connect major destinations such as parks, schools, employment centers, neighborhoods, and natural features. Greenways can reduce miles traveled in cars, with a resulting wide array of benefits for human and environmental health.

Social Equity. Greenways should provide equitable access for all citizens for physical activity and transportation. Their design should accommodate a broad level of abilities. Greenways should meet Americans with Disabilities Act (ADA) requirements for grade and the interface with streets and intersections. Beyond physical activity, the health benefits are also realized in the realms of social health, emotional health, intellectual health and spiritual health, as it provides a place for respite and can link institutions, churches and other learning and spiritual opportunities.

Economic Prosperity. Greenways are a proven economic tool for redevelopment and business attraction. Successful businesses have long understood the correlation between a healthy workforce and higher productivity. With the increase of major businesses incorporating sustainability into their way of practice, business relocations often consider the walkability and bikeability of sites. Commercial and residential developers are increasingly collaborating with local governments to help build greenways that are included as promotional features of the development.

Maintain Environmental and Ecological Integrity. The proposed greenway can help conserve the integrity of the current ecosystems and wildlife habitats by maintaining and preserving continuous corridors of natural space. As development continues, the preservation of an intact set of natural corridors is crucial to water quality, wildlife connectivity, and flood prevention. The remaining natural areas, especially in the southern portion of the greenway are the most crucial for preservation as they are flood-prone due to the presence of floodplains, karst geology, and heavy urban stormwater runoff. Some of the key concepts of this principle are:

- Protect environmentally sensitive areas by acquiring appropriate buffers surrounding the greenway in areas that have floodplains, wetlands, karst geology, or critical wildlife habitat.
- Control exotic invasive plants that out-compete natural vegetation.
- Reduce sediment and erosion problems with use of best management practices.
- Reduce stormwater runoff or treat runoff to improve water quality with use of stormwater control measures.
- Minimize life cycle and true environmental costs of greenway materials, construction methods, and maintenance activities.
- Promote human interaction with natural communities, helping to educate the public (especially children) about the critical role ecology plays to all living beings.

Plan for Compatible Land Uses. Land uses within walking distance (1/2 mile) from the corridor should be compatible with the greenway by connecting higher densities of populations and business that complement use of the greenway as a transportation route. Examples of compatible land uses include office parks, schools, church campuses, and medium to higher density housing like apartments and condominiums. Greenways in suburban/urban environments are most effective if connecting to higher densities of housing, employment, or commercial centers, especially if designed as a key feature and not a fringe element of these land uses. As discussed above, greenways are also compatible with open space, natural lands and parks.

Any new developments should be encouraged to provide the ability to connect the greenway or incorporate the greenway into the development. Case studies for how this has worked are demonstrated in Section VI, *The Economic Benefits of Greenways*.

Create a Regional Recreation Draw. This greenway has the potential to serve as a regional recreation draw if it successfully displays the best of the surrounding natural features and connects to surrounding parks. Greenways can serve as a linear park system, connecting pocket parks, trailheads, overlooks and rest areas. Greenways can celebrate natural gems of the areas like the Ten Mile Creek, the sinkhole-karst area in the southern corridor, Beaver Creek, and Melton Hill Lake.

Reinforce Sense of Place. Greenways can create sense of place for more than the path itself. Signage, wayfinding, and landscapes that are context sensitive and aesthetic can help improve the sense of place of the larger corridor and those viewing the corridor. This is the concept of "placemaking," which can be enjoyed by motorists viewing the greenway corridor, reinforced by developments surrounding the greenway, and can support a regional identity.

Phasing Recommendations

This plan provides guidance for completion of a 13.2-mile trail corridor, which will take years to implement. For purposes of planning, cost estimating, and feasibility of construction, the corridor is divided into the three phases described below and illustrated in Figure 7. Design details are illustrated on the maps following this page. Phases are chosen based on cohesiveness of current land uses, similarity in site conditions and opportunities, and level of implementation difficulty. However, opportunities (land donations, financial contributions specific to a location, etc.) may arise that may be out of sequence from these phases. In these circumstances, it is recommended these be acted upon immediately.

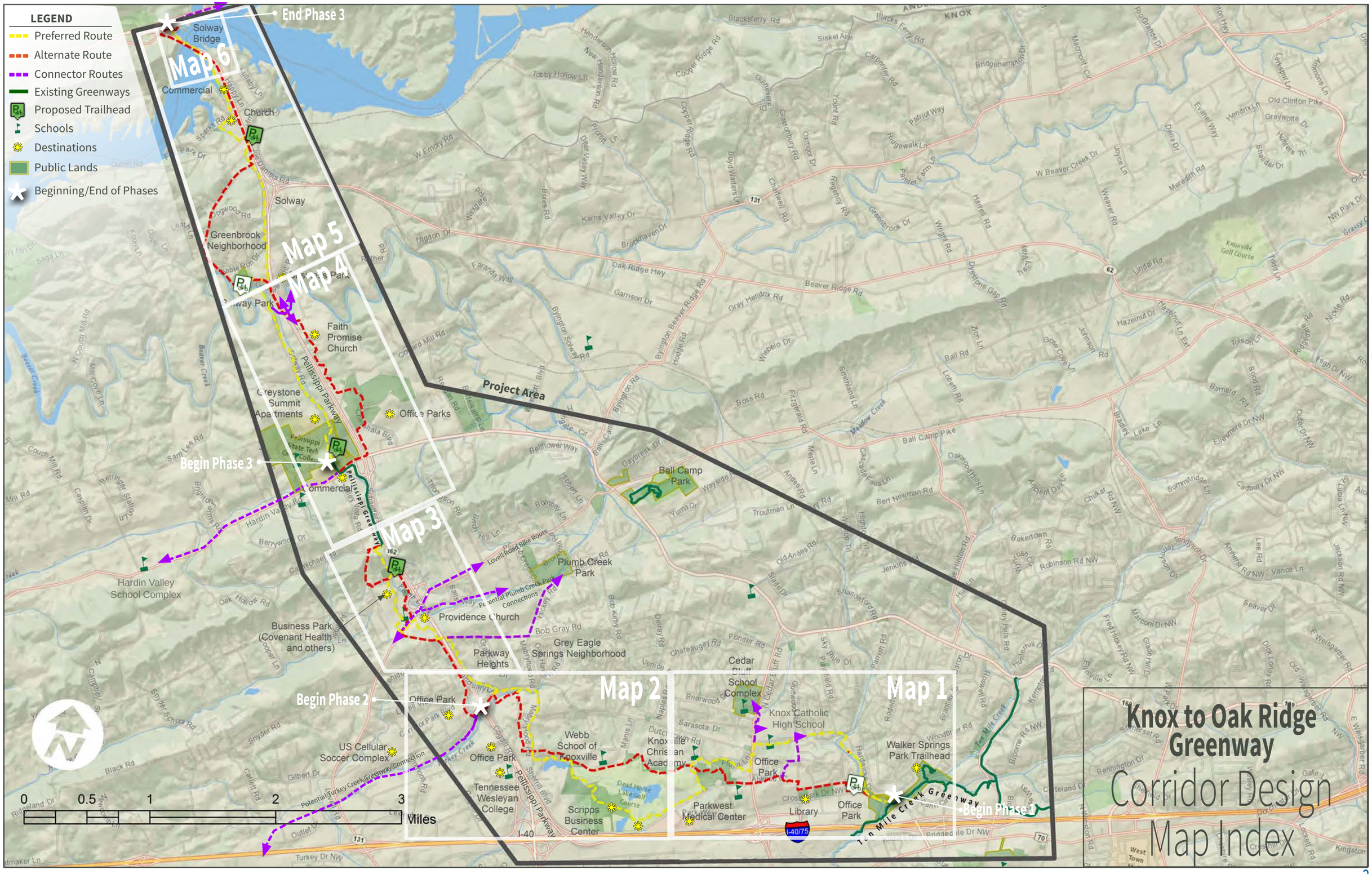
Figure 7—Phasing Summary

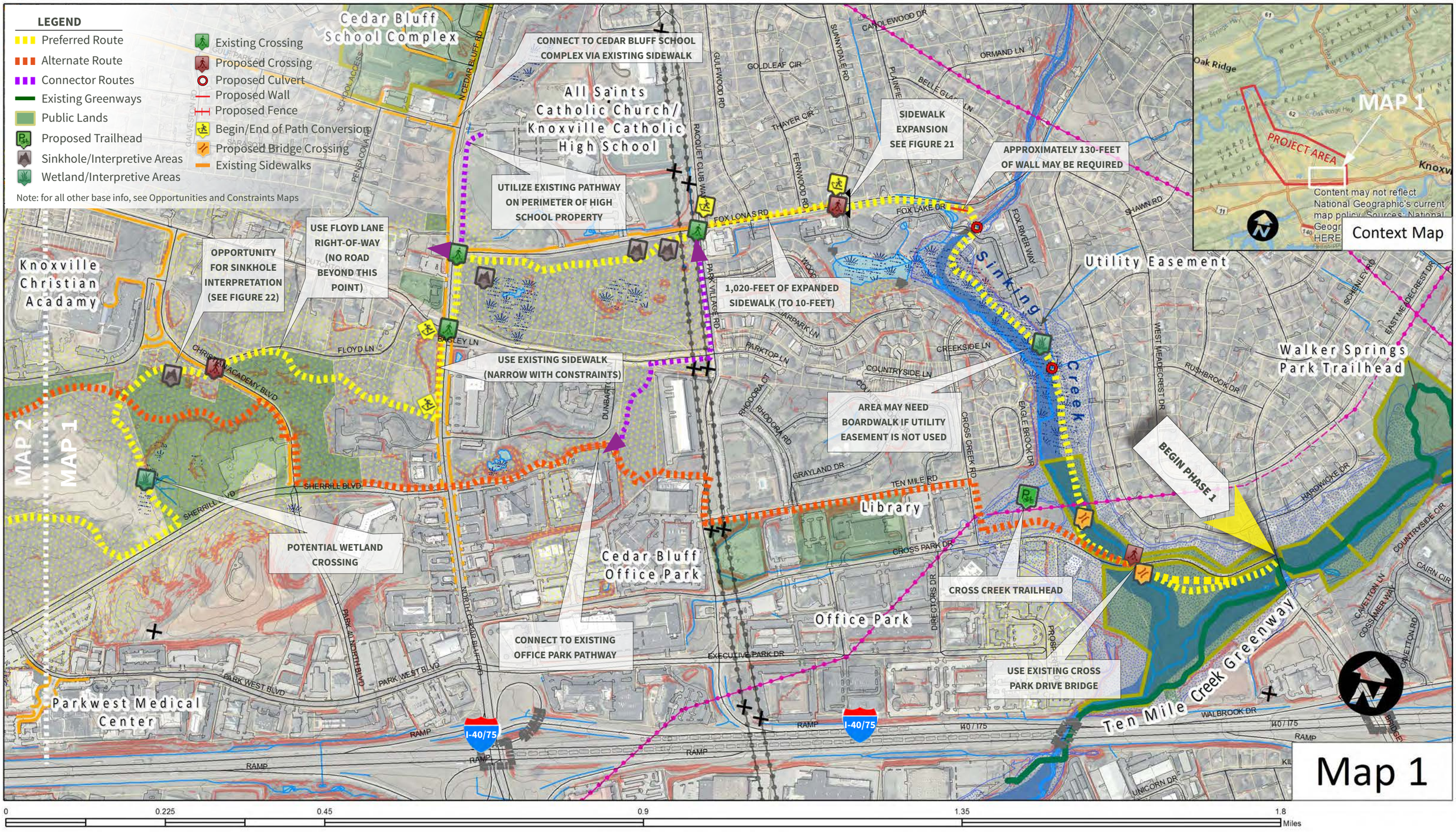
	The Southeastern Corridor (Knoxville/ Knox County Area)	The Central Corridor (Pellissippi Parkway)	The Northern Corridor (Solway Area/ Pellissippi Parkway
	PHASE 1	PHASE 2	PHASE 3
Proposed Greenway Length in Mileage (Preferred Route)	5.6 miles	2.2 miles	5.4 miles
Proposed Greenway Width	12-feet (with exception of sidewalk portions)	12-feet 10-feet (steep terrain)	12-feet 10-feet (steep terrain)
Terminus Points	Dutchtown Road	Pellissippi State Community College	North end of Solway Bridge
	APPROXIMATELY 11.5 TOTAL MILES OF NEW GREENWAY (asphalt and sidewalk improvements)		
	13.2 TOTAL MILES OF CORRIDOR (including existing greenway and sidewalks)		

PHASING DIAGRAM

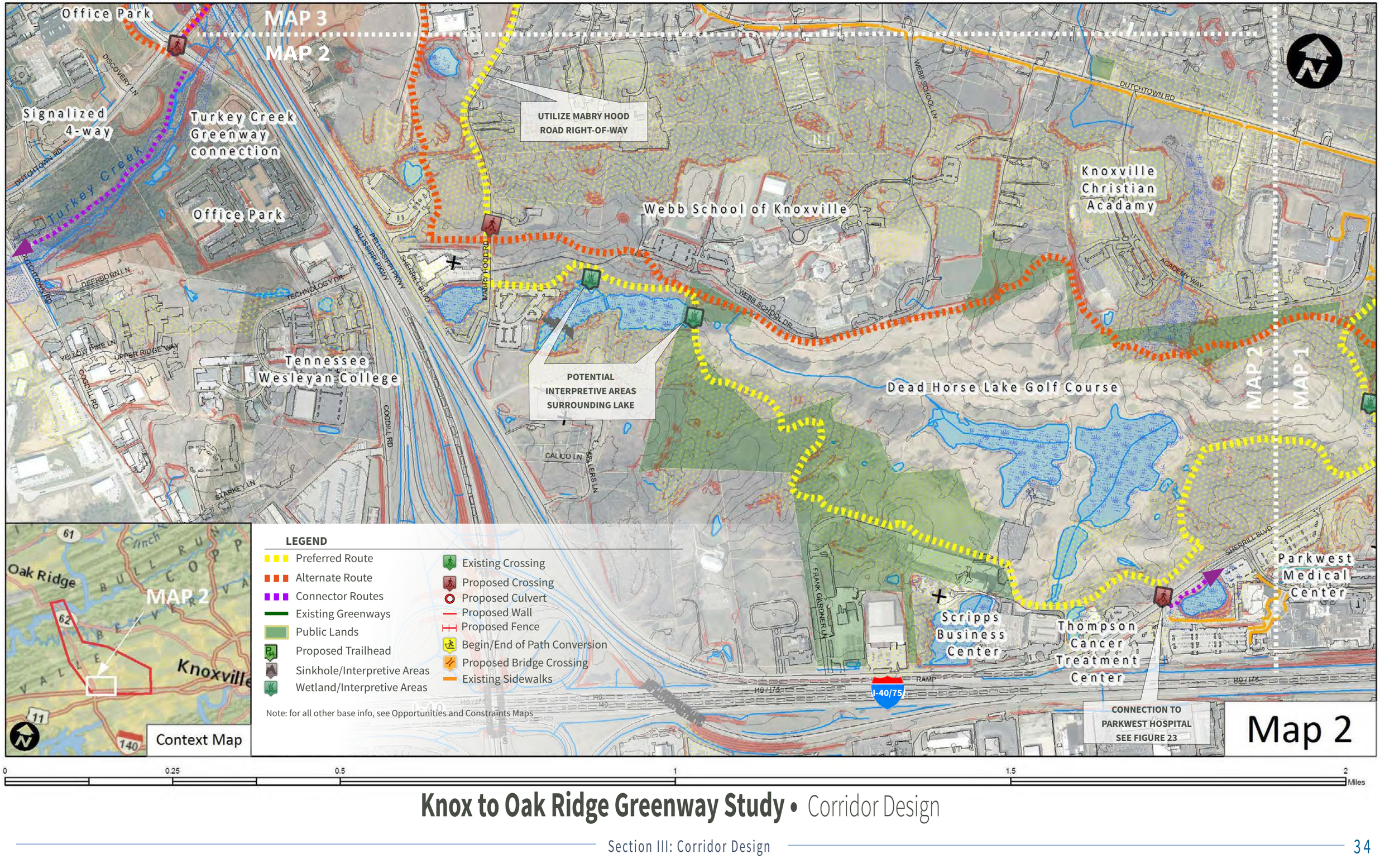
The three corridor phases:

- **Phase One: The Southeastern Corridor (Knoxville/Knox County Area)** This corridor focuses on connectivity to both the Ten Mile Creek and Turkey Creek Greenway near the junction of Dutchtown Road and the Pellissippi Parkway. The Southeastern Corridor incorporates part of both Knoxville and Knox County. It includes some of the highest densities of employment centers, planned office parks in the Mabry Road area, and several large apartment complexes. This greenway phase would have the biggest impact because of the higher concentrations of those who live, work, and play in the area. This phase has a few large and key property owners and stakeholders who if willing to accommodate the greenway, could help to establish the corridor quickly.
- **Phase Two: The Central Corridor (Pellissippi Parkway)** The central corridor starts at the intersection of Dutchtown Road and Pellissippi Parkway and extends to Pellissippi State Community College, including the existing Pellissippi Greenway. The Pellissippi Parkway is the driving force for design and experience in this section. It is recommended that the greenway cross over the Parkway at the Bob Gray Road Bridge. Lower-density residential land use and undeveloped tracts of land surround the corridor, transitioning in the north to built or planned office parks and commercial from Lovell Road to Pellissippi State Community College. This section of the greenway could be an important connector for students and workers wishing to bike commute.
- **Phase Three: The Northern Corridor (Solway Area/Pellissippi Parkway)** This phase begins just past Pellissippi State Community College on Solway Road and extends to the junction of Oak Ridge Highway with Edgemoor Road and the future connection to Melton Lake Greenway. This section is currently a mix of several land use types, including lower-density residential, Solway Park, and highway commercial surrounding the Solway area.

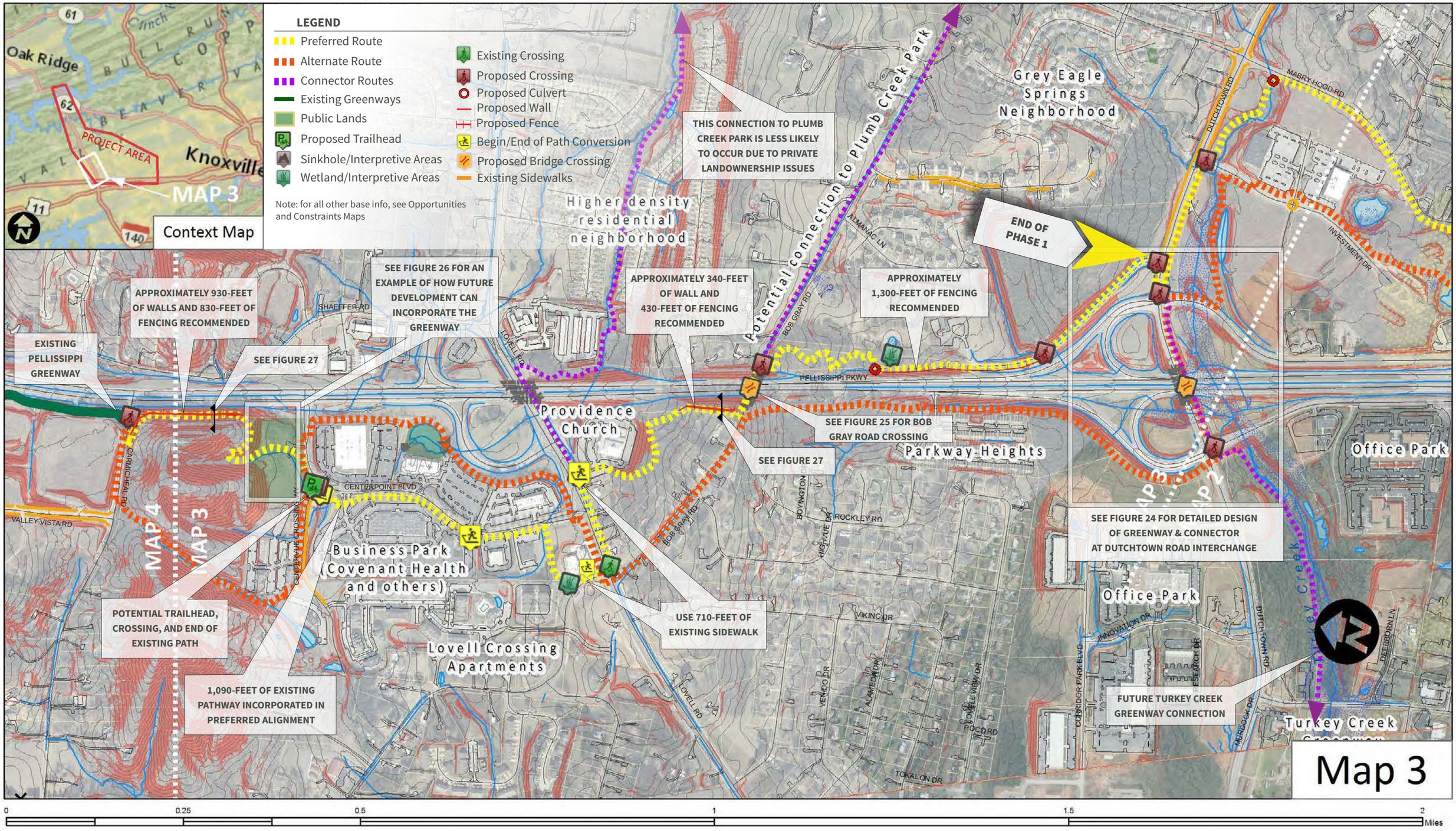

LEGEND
Preferred Route
Alternate Route
Connector Routes
Existing Greenways
Proposed Trailhead
Schools
Destinations
Public Lands
Beginning/End of Phases
End Phase 3
Begin Phase 3
Begin Phase 2
Begin Phase 1
Map 6
Map 5
Map 4
Map 3
Map 2
Map 1
Project Area
Solway Bridge
Commercial
Church
Solway
Greenbrook Neighborhood
Faith Promise Church
Greystone Summit Apartments
Office Parks
Hardin Valley School Complex
Business Park (Covenant Health and others)
Providence Church
Plumb Creek Park
Lovell Road Bike Route
Potential Plumb Creek Park Connections
Parkway Heights
Grey Eagle Springs Neighborhood
Ball Camp Park
Cedar Bluff School Complex
Knox Catholic High School
Office Park
Webb School of Knoxville
Tennessee Wesleyan College
Scripps Business Center
US Cellular Soccer Complex
Potential Turkey Creek Greenway Connection
Parkwest Medical Center
Library
Walker Springs Park Trailhead
Ten Mile Creek Greenway
Knoxville Golf Course
Pellissippi Parkway
Beaver Ridge Rd
Oak Ridge Hwy
Ball Camp Pike
Kingston
0 0.5 1 2 3 Miles
Knox to Oak Ridge Greenway
Corridor Design
Map Index

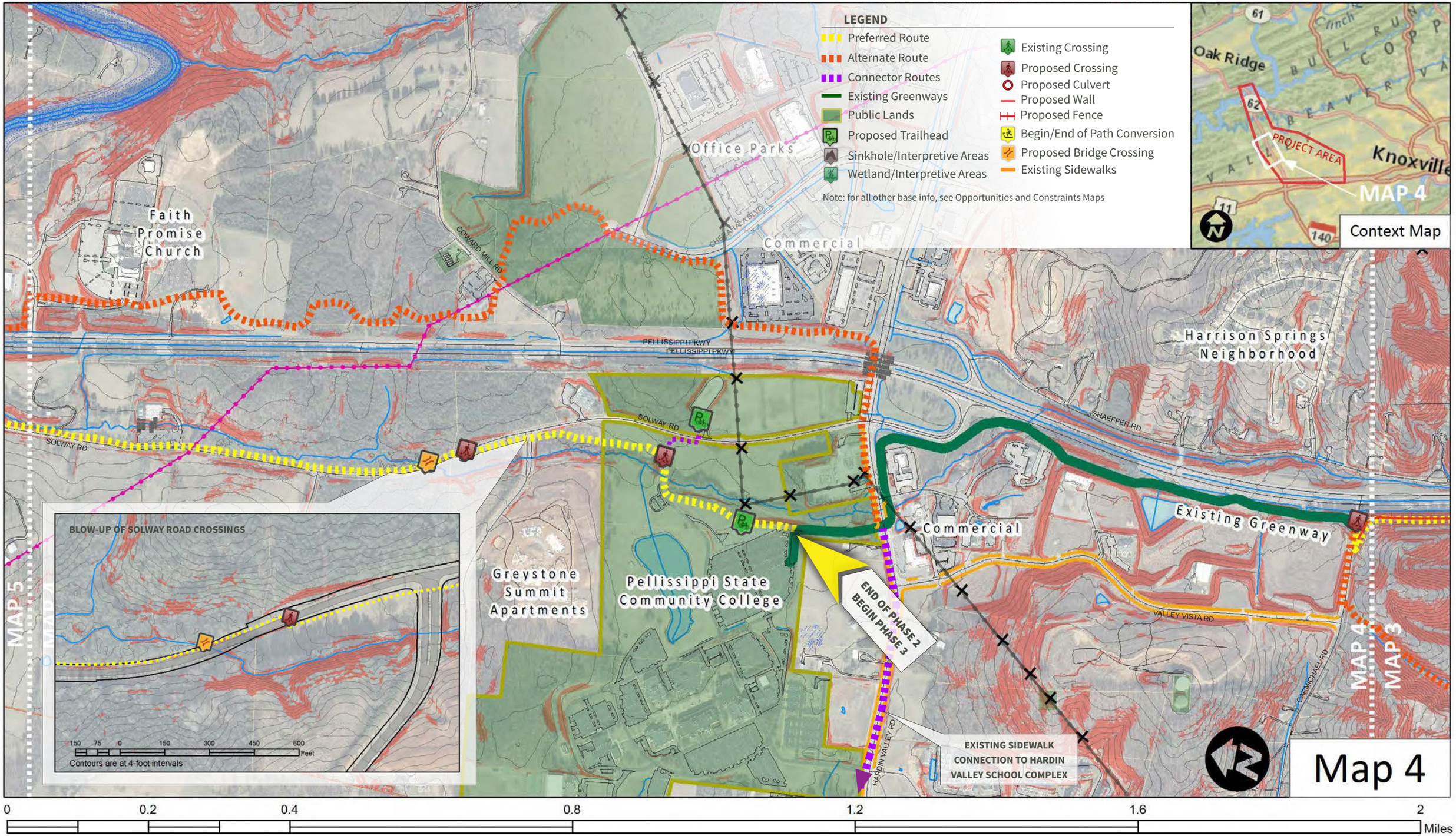


Knox to Oak Ridge Greenway Study • Corridor Design



Knox to Oak Ridge Greenway Study • Corridor Design


LEGEND
Preferred Route
Alternate Route
Connector Routes
Existing Greenways
Public Lands
Proposed Trailhead
Sinkhole/Interpretive Areas
Wetland/Interpretive Areas
Existing Crossing
Proposed Crossing
Proposed Culvert
Proposed Wall
Proposed Fence
Begin/End of Path Conversion
Proposed Bridge Crossing
Existing Sidewalks
Note: for all other base info, see Opportunities and Constraints Maps
Context Map
MAP 3
PROJECT AREA
Oak Ridge
Knoxville
THIS CONNECTION TO PLUMB CREEK PARK IS LESS LIKELY TO OCCUR DUE TO PRIVATE LANDOWNERSHIP ISSUES
Potential Connection to Plumb Creek Park
Higher density residential neighborhood
Grey Eagle Springs Neighborhood
END OF PHASE 1
APPROXIMATELY 930-FEET OF WALLS AND 830-FEET OF FENCING RECOMMENDED
SEE FIGURE 26 FOR AN EXAMPLE OF HOW FUTURE DEVELOPMENT CAN INCORPORATE THE GREENWAY
APPROXIMATELY 340-FEET OF WALL AND 430-FEET OF FENCING RECOMMENDED
APPROXIMATELY 1,300-FEET OF FENCING RECOMMENDED
EXISTING PELLISSIPPI GREENWAY
SEE FIGURE 27
SEE FIGURE 25 FOR BOB GRAY ROAD CROSSING
SEE FIGURE 27
SEE FIGURE 24 FOR DETAILED DESIGN OF GREENWAY & CONNECTOR AT DUTCHTOWN ROAD INTERCHANGE
POTENTIAL TRAILHEAD, CROSSING, AND END OF EXISTING PATH
USE 710-FEET OF EXISTING SIDEWALK
1,090-FEET OF EXISTING PATHWAY INCORPORATED IN PREFERRED ALIGNMENT
FUTURE TURKEY CREEK GREENWAY CONNECTION
Providence Church
Business Park (Covenant Health and others)
Lovell Crossing Apartments
Parkway Heights
Office Park
Office Park
Turkey Creek
SHAEFFER RD
LOVELL RD
CENTERPOINT BLVD
CENTERVILLE CROSSING
VALLEY VISTA RD
CARMICHEAL RD
BOB GRAY RD
PELLISSIPPI PKWY
ROCKLEY RD
BOYINGTON DR
HIGHVUE DR
VIKING DR
VENICE DR
ALAMEDA DR
LOVELL VIEW DR
POCO RD
TOKALON DR
ALMANAC LN
MABRY HOOD RD
DUTCHTOWN RD
INVESTMENT DR
INNOVATION DR
RESEARCH DR
CORRIDOR PARK BLVD
MURDOCK DR
DEERBORN LN
MAP 4
MAP 3
MAP 2
0
0.25
0.5
1
1.5
2
Miles



Knox to Oak Ridge Greenway Study • Corridor Design

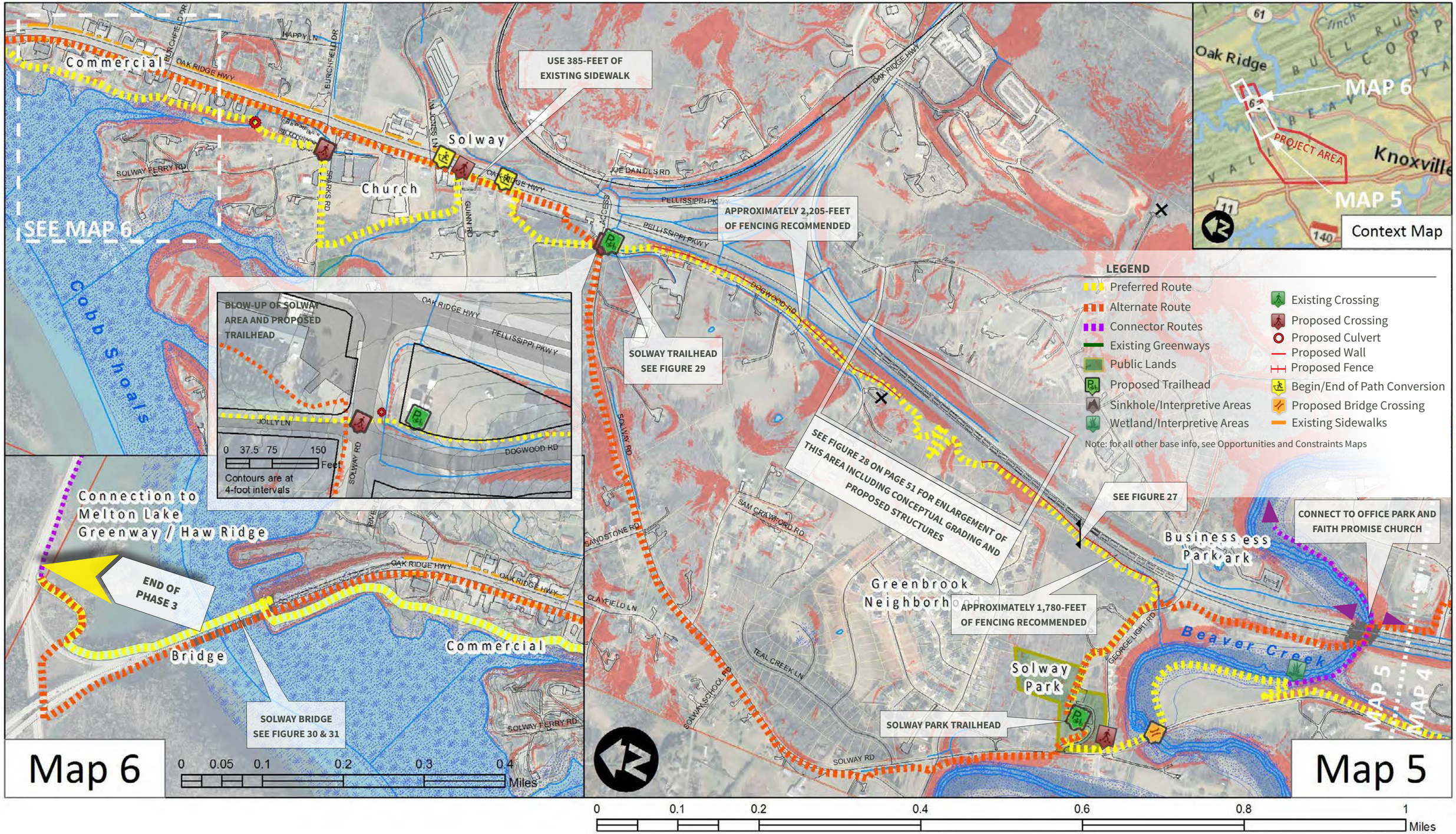

Commercial
OAK RIDGE HWY
BURCHFIELD DR
HAPPY LN
SOLWAY FERRY RD
SHARKS RD
Church
Solway
J.M. JONES LN
GUINN RD
SEE MAP 6
USE 385-FEET OF EXISTING SIDEWALK
JOE DANIELS RD
PELLISSIPPI PKWY
ACCESS
APPROXIMATELY 2,205-FEET OF FENCING RECOMMENDED
DOGWOOD RD
SOLWAY TRAILHEAD SEE FIGURE 29
BLOW-UP OF SOLWAY AREA AND PROPOSED TRAILHEAD
JOLLY LN
0 37.5 75 150 Feet
Contours are at 4-foot intervals
SOLWAY RD
Cobb Shoals
Connection to Melton Lake Greenway / Haw Ridge
END OF PHASE 3
Bridge
SOLWAY BRIDGE SEE FIGURE 30 & 31
Map 6
0 0.05 0.1 0.2 0.3 0.4 Miles
SEE FIGURE 28 ON PAGE 51 FOR ENLARGEMENT OF THIS AREA INCLUDING CONCEPTUAL GRADING AND PROPOSED STRUCTURES
SEE FIGURE 27
CONNECT TO OFFICE PARK AND FAITH PROMISE CHURCH
SAM CRAWFORD RD
SANDSTONE RD
CLAYFIELD LN
TEAL CREEK LN
SOLWAY SCHOOL RD
Greenbrook Neighborhood
APPROXIMATELY 1,780-FEET OF FENCING RECOMMENDED
Business Park
Solway Park
GEORGE LIGHT RD
Beaver Creek
SOLWAY PARK TRAILHEAD
MAP 5
MAP 4
Map 5
0 0.1 0.2 0.4 0.6 0.8 1 Miles
Oak Ridge
Clinch
BULL RUN
COPP
BEAVER
VALLEY
MAP 6
PROJECT AREA
Knoxville
MAP 5
Context Map
LEGEND
Preferred Route
Alternate Route
Connector Routes
Existing Greenways
Public Lands
Proposed Trailhead
Sinkhole/Interpretive Areas
Wetland/Interpretive Areas
Existing Crossing
Proposed Crossing
Proposed Culvert
Proposed Wall
Proposed Fence
Begin/End of Path Conversion
Proposed Bridge Crossing
Existing Sidewalks
Note: for all other base info, see Opportunities and Constraints Maps

Figure 8—Pathway Approach to Signalized Intersection, Ketchum, ID. *Image Courtesy of Don Kostelec*

Figure 9—Multi-Use Trail Approach to Sidewalk Intersection & Mid-Block Crossing, Milton, DE. *Image Courtesy of Don Kostelec*

Figure 10—Inlaid Pavement Markings on Pathway & Street, Toronto, ON. *Image Courtesy of Don Kostelec*

Figure 11—Pathway Approach on the American Tobacco Trail, Durham, NC. *Image Courtesy of Don Kostelec*

Overall Recommendations for Street Approaches and Crossings

There are numerous crossings of major and minor roads within the greenway corridor, and enhancing these areas for safety, greenway user visibility, and wayfinding is crucial. It is key to make trail users visible to motorists.

Guidance on how to best treat greenway trail approaches and crossings to streets isn't outlined in detail in many prevailing design guides because of the variety of contexts in which they exist. This section contains some conceptual design treatments based on how other communities have addressed road crossings.

A good local resource on trail design is Greenway Guidelines for the East Tennessee Region, available on the Plan East Tennessee website. Other design references include AASHTO's Guide for the Development of Bicycle Facilities, Forest Service Trail Accessibility Guidelines (FSTAG), and ABA Guidelines for Outdoor Developed Areas.

Below is a catalog of some of the most common crossing scenarios for communities to consider in the corridor. These treatments are identified specifically in design recommendations for each phase. Further details of appropriate design treatments should be evaluated when the greenway enters the design phase and more detailed information is obtained through in-the-field surveys of conditions.

Street and Driveway Approaches

Greenway approaches to driveways and intersections should be designed to encourage both greenway and road users to be aware and exercise caution. Designers have greater latitude in the realm of greenway design as compared with public street rights-of-way , which are subject to standards established through the various highway design manuals, such as the Manual on Uniform Traffic Control Devices (MUTCD).

Figure 8 shows a greenway approach to a signalized intersection where designers used pavement markings to caution pedestrians and bicyclists about the approaching intersection. Colored markings can also alert greenway users to an approaching intersection or driveway. Figure 9 illustrates an inlaid brick transition space from a pathway, letting users know they are nearing a place where conditions change.

More elaborate treatments can be pursued based on the context of surrounding land uses and volumes of pathway traffic. Figure 10 illustrates an approach to a two-stage mid-block crossing with inlaid pavement markings on both the pathway and street to alert motorists and pedestrians to the crossing. Inlaid pavement markings can cost more to install and maintain. Choose markings with high visibility to drivers.

The use of bollards (as seen in Figure 11) and markings on greenway approaches to streets alerts pedestrians and bicyclists to the crossing. Painting the name of cross streets on the greenway allows users to orient themselves to their surroundings, especially if their destination is off the trail.

Greenways often double as sidewalks. Greenways running parallel to roads are known as sidepaths. Street crossings of a sidepath should be treated the same as a sidewalk approach in terms of accommodation of ADA Public Right-of-Way Accessibility Guidelines (PROWAG) established by the United States Access Board. (Note: The Access Board is set to develop a new set of guidelines pertaining to multi-use trails. It could be several years before these guidelines are published, but they should be considered in the design of this and other greenways.) Figure 12 shows a greenway/sidewalk approach to the street that includes the following ADA features:

- Curb ramp width that is the same as the width of the sidepath (minimum 10 feet);
- Detectable warning surface (truncated domes) spanning the entire width of the ramp; and
- Colored detectable warning surface that meets visual contrast standards with the paving material.

Figure 12—Sidepath curb ramp, Burlington, WA.
Image Courtesy of Don Kostelec

Figure 13—MUTCD signage (W11-15P) on street approach to trail crossing, Asheville, NC .
Image Courtesy of Don Kostelec

In most situations, motorists are accustomed to the presence of pedestrians on sidewalks that cross public streets and driveways. The dynamic changes when diverse users are introduced to that setting. Bicyclists travel at higher speed than pedestrians. If motorists are accustomed to seeing bicyclists on the streets, they may also not be prepared for bicyclists crossing from two directions in front of their path.

Driveways and streets can be treated differently, as private driveways are not always subject to requirements of MUTCD, which dictates the type of traffic control devices (signs, pavement markings, etc.) that can be installed on streets. A common treatment on street approaches to greenway trail crossings is installation of MUTCD-compliant signage (reference sign W11-15P) that indicates the presence of pedestrians and bicyclists at a trail crossing. Figure 13 shows an example of this sign application. Pavement marking treatments at the intersection of a greenway and a street can range from standard and high-visibility crosswalks to raised crosswalks and inlaid colored pavement or similar treatments. Maintenance costs are a primary consideration in determining which treatment gets selected. Raised crosswalks are more appropriate for downtown areas, whereas high-visibility crosswalks are typically found in more suburban locations. As use of the greenway increases, additional marking options can be pursued to raise awareness of the trail.

Figure 14—Path crossing advanced warning markings on private street, Ketchum, ID

Figure 15—Advanced warning markings on private street, Ketchum, ID

Figure 16—Path crossing from private street, Ketchum, ID

Figure 17—Colored pavement at two-way path / driveway crossing (NACTO)

Figure 18—Shared sidewalk signage, Halifax, NS

Figure 19—Shared route signage along public street, Moncton, NS

Figure 20—Other greenway signs for various conditions.
All images on this page courtesy of Don Kostelec

As noted, driveway crossings allow for greater latitude in terms of treatment options. Figure 14 illustrates potential pavement markings and signage for driveway crossings of the greenway.

The National Association of City Transportation Officials (NACTO) is developing new treatments for bicycle facilities, some of which are compliant with existing MUTCD standards while others are considered experimental in the eyes of the Federal Highway Administration and some state DOTs. Much of the emphasis in NACTO is how to integrate nontraditional bicycle facilities (e.g. cycle tracks, bike boxes) into an urban environment. In June 2014, TDOT became the first southern state DOT and sixth state DOT overall to officially endorse NACTO's Urban Street Design Guide, citing the NACTO guide as a "valuable resource that offers cost effective solutions that Tennessee communities can embrace and implement."

Figure 17 illustrates a concept in the NACTO Urban Bikeway Design Guide for a driveway crossing of a two-way cycle track. The green pavement marking at the crossing raises the visibility of the crossing to entering and exiting motorists. Similar applications apply to driveway crossings along the greenway.

See Maps 1 & 2 for Phase 1

Phase 1

Phase 1: The Southeast Corridor Recommended Design Features

Proposed features of the Southeast Corridor (see Corridor Design Maps 1 and 2 for correlating info). Design recommendations for the Southeast Corridor, beginning at the connection of the existing Ten Mile Creek Greenway, include:

Develop a Cross Creek Trailhead. The proposed trailhead would exist in the area of the intersection of Cross Creek Road and Cross Park Drive. A significant portion of this area sits within the 100-year floodplain and would have development constraints. The most appropriate area for the trailhead's structures and parking would be in the 500-year floodplain, an area which would provide ample parking.

Use A Short On-Road Section On Cross Park Drive to Navigate the Initial Crossing of Sinking Creek. Crossing over the box culvert on-road is a low-cost option to the first crossing of Sinking Creek. The shoulder would need to be widened.

Sinking Creek Crossing Structures Needed. At least one bridge is needed to cross Ten Mile Creek. The bridge span may need to be around 40 feet based on the existing bridge/road overpass downstream on Bridgewater Road. Additional tributary crossings of Sinking Creek can be accommodated with culverts and have been noted on the Corridor Design Maps.

Right-of-way sharing. An existing sewer line and easement are located in this area. It is preferred to utilize

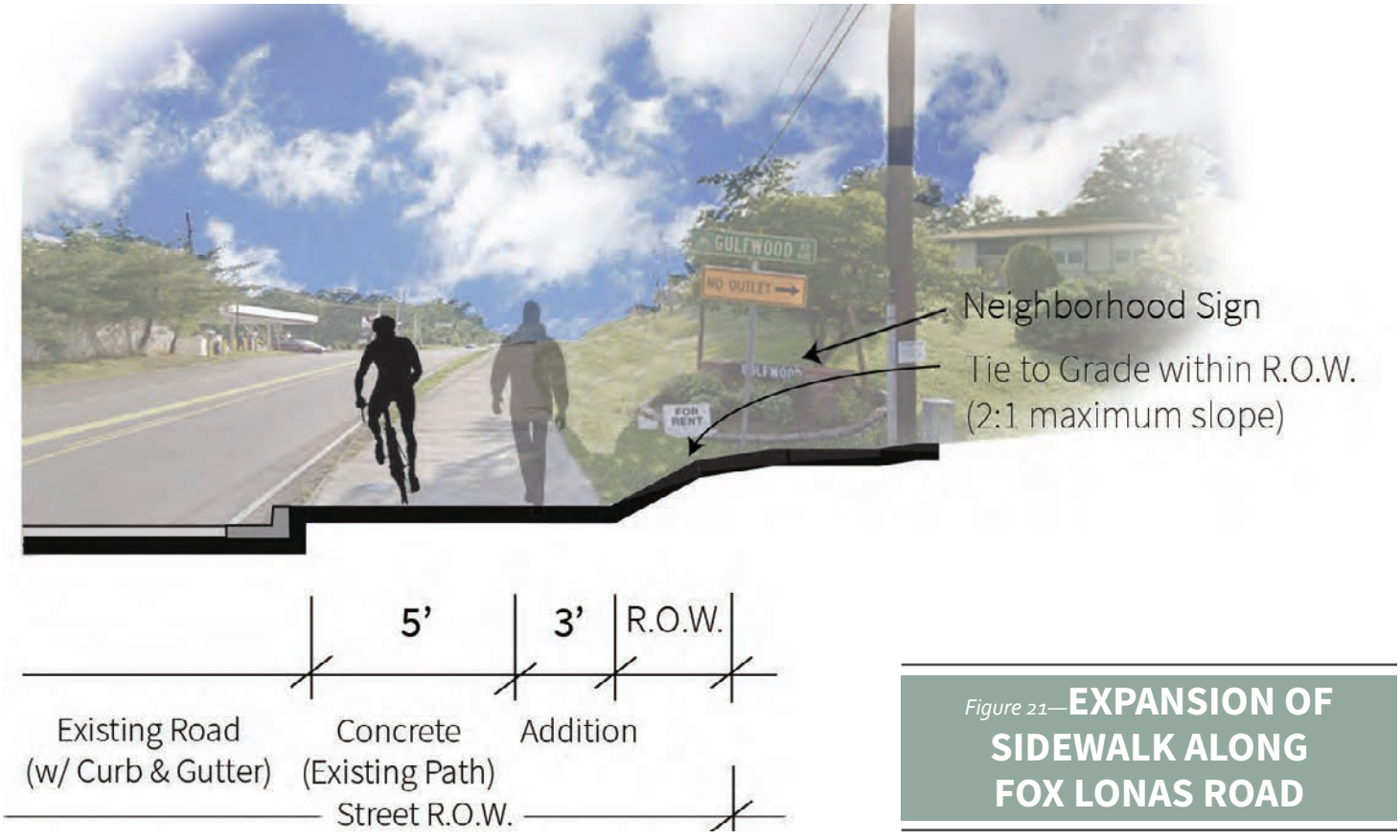


Figure 21—**EXPANSION OF SIDEWALK ALONG FOX LONAS ROAD**

this easement, if possible, to reduce the amount of easement needed on private land, and to reduce additional environmental impacts. The surrounding area is within a floodway and likely contains wetlands. If the greenway cannot be located within the sewer easement, before securing a right-of-way, a full wetland and floodway survey would be needed to determine the preferred alignment. If impact to the floodway or wetlands is unavoidable, a boardwalk system is recommended. Prefabricated boardwalk systems are available that do not use permanent footers and that have minimal impact during construction.

Expand Sidewalk Along the Northern Part of Fox Lonas Road and Install Crosswalk at Fox Crossing Boulevard/Sunnydale Road. Once leaving the Fox Lake Apartments, a mid-block crosswalk between Sunnydale and Fernwood Roads is recommended. The current sidewalk on the north side of Fox Lonas Road is only 4-5-feet wide and should be expanded to a minimum of 8-feet for several blocks, ending at Park Village Road. The right-of-way along Fox Lonas Road appears to accommodate this potential expansion. See Figure 21 for visual representation of these recommendations. A landscaped island or grass strip separating the roadway and greenway is preferred when feasible. Sidewalk expansion may require relocation of a few utility poles.

Use Sinkhole Areas As Point of Interest, Avoiding Areas That Are Environmentally Sensitive or Unsuitable for Greenway Development. The greenway corridor would pass through a large sinkhole/karst area, near sinkholes that could have significantly sized rims of 30-80 feet. Many trails in the U.S. feature sinkholes as their draw. If designed well, a greenway can navigate the "pit falls" of a caving pathway while celebrating this geologic phenomenon. A highly qualified geotechnical engineer is critical to identify the most susceptible locations of failure so that the greenway alignment can avoid or mitigate sinkhole-prone areas.

These areas are ideal for interpretive education on the unique hydrological and geological features such as the connecting underground streams that feed into Sinking Creek and Ten Mile Creek. Refer to the Existing Conditions Section for information on sustainably designed greenways in karst geology/sinkhole prone areas. Figure 22 shows two examples of greenways that utilize structures that are low impact and offer opportunity for interpretation.

Explore Opportunities For Platform Rest Areas. The water body between Dead Horse Lake Golf Course and the Webb School would be an excellent resting/passive recreation area for greenways users. Platform areas (see Figure 22) that incorporate seating areas would provide good views and complement this area.

Figure 22—Example of a Viewing Platform/Rest Area That Interplays With Karst Formations and Sinkholes.
Image on left courtesy of Equinox (decking displays a Cherokee heritage site) and image on right courtesy of Dahn Designs.

Phase 1 Recommended Road Crossing Improvements

Road Crossings	*Recommended Type of Crossing*
Cross Park Drive	Mid-block crosswalk near Sinking Creek (including widened shoulder at Sinking Creek Bridge crossing)
Fox Lonas Road	Mid-block crosswalk (between Sunnydale and Fernwood Roads)
Christian Academy Boulevard	Mid-block crosswalk (between Sherrill Boulevard and Dutchtown Road)
Sherrill Boulevard	Mid-block crossing (between Park 40 North Boulevard and Park West Boulevard), use median on Sherrill Boulevard as pedestrian refuge (see Figure 23)
Mabry Hood Road	Mid-block crossing (just south of Webb School Lane)
Investment Drive	Marked crosswalk at intersection with Dutchtown Road
Dutchtown Road/Pellissippi Parkway Interchange	Crosswalks at signalized intersections (see Figure 24)

The intersection of Dutchtown Road and Pellissippi Parkway is the most complicated crossing in the study area. Design recommendations are shown in Figure 24, which illustrates treatment options to cross Dutchtown Road, to continue the greenway north, and a connection across the Parkway toward Turkey Creek Greenway.

Figure 23—Example of a crossing with a pedestrian refuge that could be used to connect the greenway to Parkwest Medical Center. *Image Courtesy of Dan Burden*

Phase 1: The Southeast Corridor Recommended Connections

Recommended connections include:

- **Connect to Cedar Bluff Office Park**. A viable connection to Cedar Bluff Office Park would serve a complex that houses hundreds of employees. This connector could connect into the current path around the perimeter of the property.
- **Connect to North Cedar Bluff Schools and Apartments**. This is a critical connection to the Cedar Bluff School Complex, Knoxville Catholic High School and All Saints Church, and the Sunchase Apartments.
- **Connect to Parkwest Medical Center**. Connect the existing sidewalk network within the hospital complex. Figure 23 shows an example of this crossing type.
- **Connect to the Turkey Creek Greenway** (See Figure 24 for detail of proposed crossing). The connection to the greenway is the best potential off-road connection across I-40/75. An office park has been approved on the southwest corner of the Dutchtown Road/Parkway interchange. This development will be a critical connection to link the greenway and the Turkey Creek Greenway together.

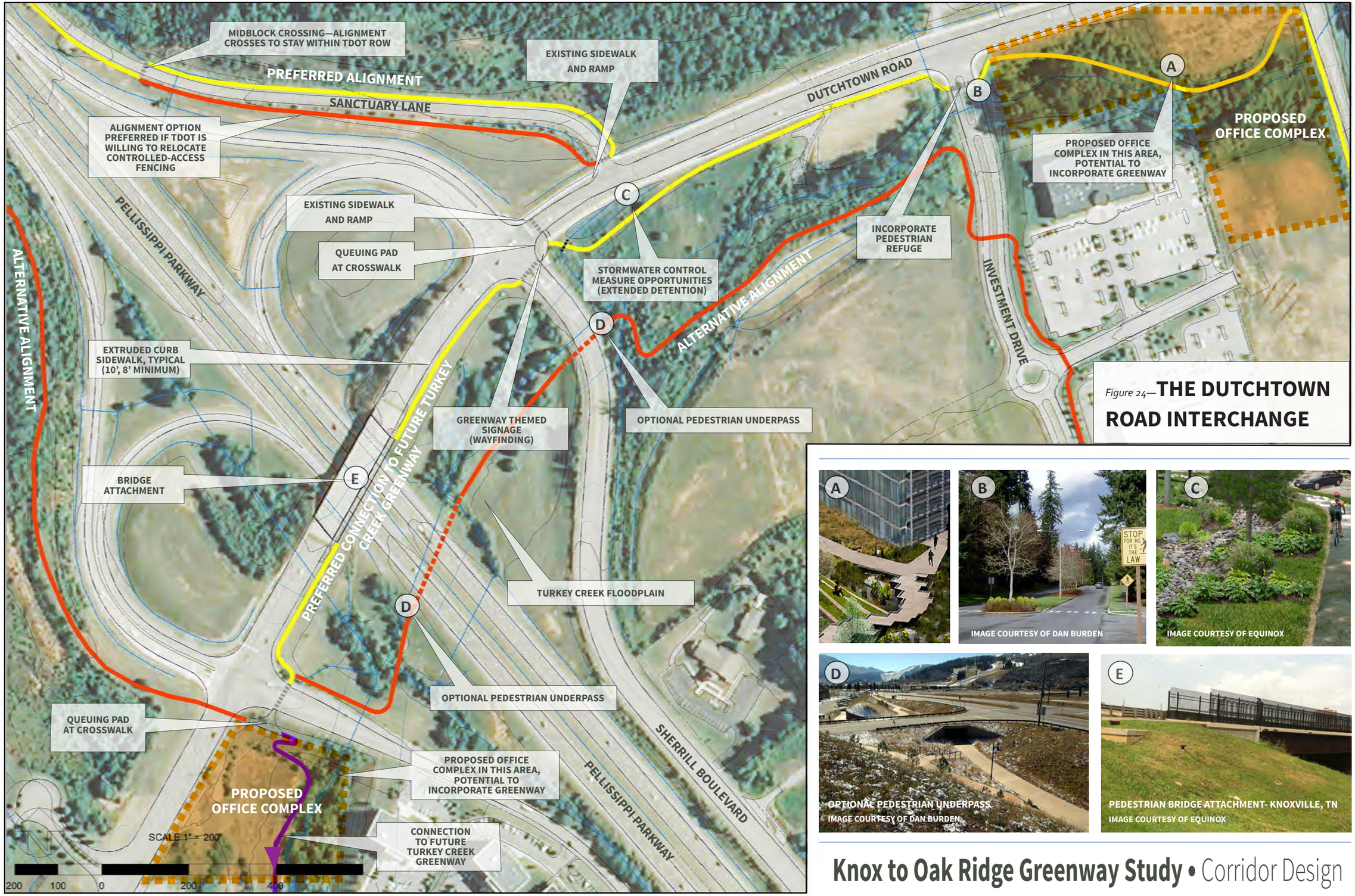


Figure 24—**THE DUTCHTOWN ROAD INTERCHANGE**

IMAGE COURTESY OF DAN BURDEN

IMAGE COURTESY OF EQUINOX

OPTIONAL PEDESTRIAN UNDERPASS
IMAGE COURTESY OF DAN BURDEN

PEDESTRIAN BRIDGE ATTACHMENT- KNOXVILLE, TN
IMAGE COURTESY OF EQUINOX

See Maps 3 & 4 for Phase 2

Phase 2

Phase 2: The Central Corridor (Pellissippi Parkway) Recommended Design Features

Proposed features of the Central Corridor. The following features are recommended in the Central Corridor, beginning at the crossing of Dutchtown Road:

Develop Greenway Design with TDOT Controlled-Access Constraints in Mind. Controlled-access of the Pellissippi Parkway is a constraint along Sanctuary Lane. TDOT requirements for the Pellissippi Parkway and controlled-access are discussed in more detail in Appendix B, TDOT Stakeholder Workshop.

Navigate Potential Wetland and Drainage Crossings From Sanctuary Lane to Bob Gray Road. This may require multiple culvert crossings.

Retrofit the Bob Gray Road Bridge Crossing Over the Parkway. The existing bridge can accommodate a dedicated lane for pedestrians and bicyclists, preferably separated by a divider. Figure 25 illustrates the bridge retrofits to accommodate a divided pedestrian/bike lane. Knox County owns this bridge.

Plan for use of retaining walls and fencing within the Parkway ROW north of Bob Gray Road. Because of the steep slopes within the ROW, retaining walls would likely be needed. Due to controlled access, DOT will likely require fencing on the downhill and private property sides. Figure 27 illustrates what this may look like.

Connect to Existing Sidewalk, Bike Lane, and Four-way Marked Crosswalk On Lovell Road.

Tie Into Existing Pathway On Covenant Health Campus. The existing asphalt pathway is ADA accessible but is 8-feet wide, which is narrower than the recommended 10-foot greenway width.

Integrate Greenway Design Into Future Site Planning for Property Owned by the Development Corporation of Knoxville County (TDC). This property (1440 Centerpoint Boulevard) is a critical piece for connecting into the existing Pellissippi Greenway and for navigating the most challenging steep slopes of Beaver Ridge. The greenway alignment will need to ascend the hillside along a drainage swale and then use switchbacks to maintain ADA-compliant grades. Figure 26 illustrates how future office park development can integrate the greenway.

Use Parkway ROW to Connect to the Existing Pellissippi Greenway, Utilizing Retaining Walls, Fencing, and Switchbacks. The greenway is proposed to cross mid-slope and mid-section of the ROW approximately 20-feet above the Parkway. Because of the steep slopes and use of ROW, fencing and retaining walls are likely needed. Figure 27 illustrates what this would look like. The greenway could feasibly use Parkway ROW to switchback, descending to Carmichael Road and the existing Pellissippi Greenway. The stairs should not be designated as part of the route unless a comparable alternate route is designated or constructed, as the stairs do not meet ADA guidelines.

Phase 2 Recommended Road Crossing Improvements

Road Crossings	*Recommended Type of Crossing*
Sanctuary Lane	Mid-block crossing (between Dutchtown Road and the terminus of Sanctuary Lane)
Bob Gray Road	Mid-block crossing (just east of bridge) would allow greenway users to access the proposed dedicated lane on Bob Gray Road Bridge.
Centervue Crossing Way	Marked crossing (just west of intersection with Centerpoint Boulevard)
Carmichael Road	Mid-block crossing (between Valley Vista Road and the Parkway) to connect into existing Pellissippi Greenway.

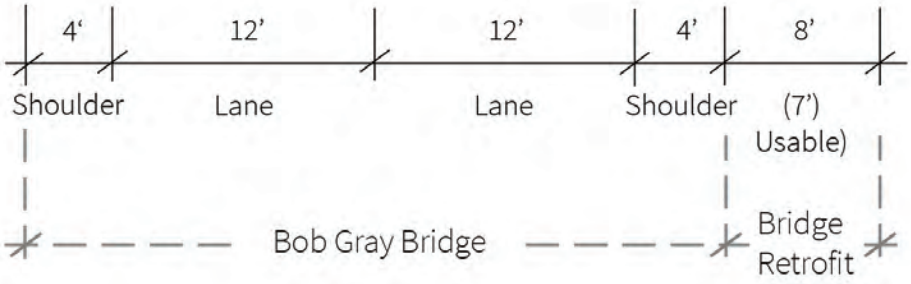


Figure 25—**BOB GRAY ROAD BRIDGE RETROFIT (FOR THE CROSSING OF PELLISSIPPI PARKWAY)**

Figure 26—ENLARGED EXAMPLES OF GREENWAY FEATURES ALONG OFFICE PARKS

Opportunities for Stormwater Treatment: Office parks can utilize the greenway not only as a major circulation path but also as an opportunity for stormwater treatment. Water from parking lots and roofs can be drained to bio-swales, constructed wetlands, and other features that parallel the greenway and become a key feature of it.

Outdoor Plazas:
Outdoor plazas give the greenway a sense of vibrancy.

Signage & Greenway Parking
Wayfinding signage in more developed areas is key to greenway users and should be considered in office park master planning. Parking for greenway users should be accommodated.

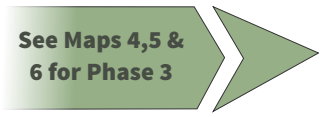
Figure 26—**GREENWAY INTEGRATION INTO FUTURE CENTERPOINT OFFICE PARK DEVELOPMENT**

Example of a greenway treatment through office parks.
Image courtesy of Karlis Dambrans

Example of a greenway treatment through office parks.
Image courtesy of PlanET

Phase 2: The Central Corridor (Pellissippi Parkway) Recommended Connections

- **Connect to Plumb Creek Park.** A greenway connection to Plumb Creek Park as shown in the Park, Recreation, and Greenways Plan recommends an alignment that would follow Plumb Creek. Unfortunately, land along this corridor has been subdivided with many single-family parcels. Further study may yield a potential solution. If this connection is made, the Lovell Road/ Parkway underpass would be utilized. An alternate route to connect to Plumb Creek Park may be a bike route from Bob Gray Road to Hickey Road. If this is designated as a bike route, Bob Gray will more easily accommodate a dedicated shoulder than Hickey.
- **Connect to Lovell Road Bicycle Lanes**. Lovell Road includes bike lanes through the corridor, providing a connection most of the way to the Turkey Creek Greenway.
- **Connect to the Existing Pellissippi Greenway**.



Phase 3

Phase 3: The Northern Corridor (Solway Area/Pellissippi Parkway) Recommended Design Features

Proposed features of the Northern Corridor. The following features are recommended, starting at the northern terminus of the Pellissippi Greenway at Pellissippi State Community College:

Develop A Trailhead At Pellissippi State Community College. The parking area where the existing greenway terminates is located in the middle of the total proposed greenway corridor. A trailhead here could serve as a rest station with various amenities for greenway users. If the College was unable to accommodate this type of trailhead, the Pellissippi Soccer Fields across Solway Road could be an alternate location.

Navigate the Drainage Paralleling Solway Road. A small creek paralleling Solway Road would have some design implications on the greenway. Detailed study and design should further analyze constraints like poorly draining soils, wetlands, and associated conditions. At least one bridge crossing is needed and it may be determined that additional culverts or bridge crossings are required.

Use Solway Road ROW For the Greenway Alignment To Extents Possible. The ROW varies from 40 to more than 60 feet, with pavement width of 18-20 feet, and can likely accommodate up to 4,400 linear feet of greenway along Solway Road. This section includes the majority of the greenway from Pellissippi State Community College to Solway Park.

Design the Greenway to Parallel and Be Visually Connected to Beaver Creek. Beaver Creek is one of the most important natural features in the study area and is also designated as a future greenway corridor. For this reason, the greenway should parallel the creek for some portion nearing George Light Road. Design should consider floodway and wetland constraints as addressed in the Existing Conditions section. This area could host a wildlife-viewing platform and/or rest area (see Figure 34 for an example of this). Access to the creek should be accommodated at appropriate locations.

Develop a Solway Park Trailhead. This location already accommodates parking, and could feature other greenway amenities.

Utilize Parkway ROW North of George Light Road. This area has some of the steepest topography of the whole corridor. Switchbacks are needed nearing Dogwood Road, which would take the greenway out of Parkway ROW and would require negotiation with landowners for additional right-of-way. Figure 27 and 28 illustrate design considerations for this challenging section.

Fence Downhill Side of Greenway When Paralleling Dogwood Road. TDOT will likely require fencing to restrict downhill side access to the Parkway ROW as it narrows.

Develop a Solway Trailhead. A trailhead with parking and amenities could be located at the junction of Solway Road and Pellissippi Parkway as the gateway to the Solway area. As there are no public lands in this area, this would require negotiations with private land owners. Figure 29 illustrates what the approach from Dogwood Road to this area might look like.

Parallel Drainage Ways Within the Solway Area. There are two drainage ways that have undeveloped riparian buffers that may be suitable locations for the greenway. The most northern drainage way may require a higher level of stormwater management as stormwater from much of the commercial area's impervious surface would drain across the greenway and into the drainage way . This allows opportunity for stormwater control measures (SCMs) paralleling the greenway, which would capture stormwater before entering Melton Hill Lake (See Figure 35 for an example). These features can become visually appealing, but often require considerable land to accommodate design volumes and treatment capacities. Additional culverts for cross drainage may be needed.

Engage Conversation with Tennessee Valley Authority (TVA) About Lands Surrounding Melton Hill Lake. TVA will be a critical stakeholder if the preferred alignment is chosen. TVA either owns or has access agreements for much of the land along Melton Hill Lake. Early negotiations with TVA will best determine the feasibility of routing near the shore of Melton Hill Lake. Additional considerations are addressed further in the section about TVA lands in the Existing Conditions Section.

Consider Concentrated Redevelopment Efforts in the Solway/Melton Hill Lake Area That Complement the Greenway. Vacant lots and storefronts are common along the stretch of Solway that borders the Lake. This area has unrealized potential as being a regional draw for commercial and other kinds of development that take advantage of greenway and lake frontage. The lack of sewer infrastructure in this part of the County is a restraint on development. Restaurants with outdoor patios, outfitters, churches, small private or charter schools, live/work units, small office complexes, and gas stations are all within the realm of possibility through this corridor. Additionally, medium density residential development like condos and small apartment complexes that are allowed to infill within a quarter-mile of the corridor would provide life to the commercial corridor. The greenway and housing can provide opportunity for commuters to live within biking distance of Oak Ridge National Laboratory and other nearby employers.

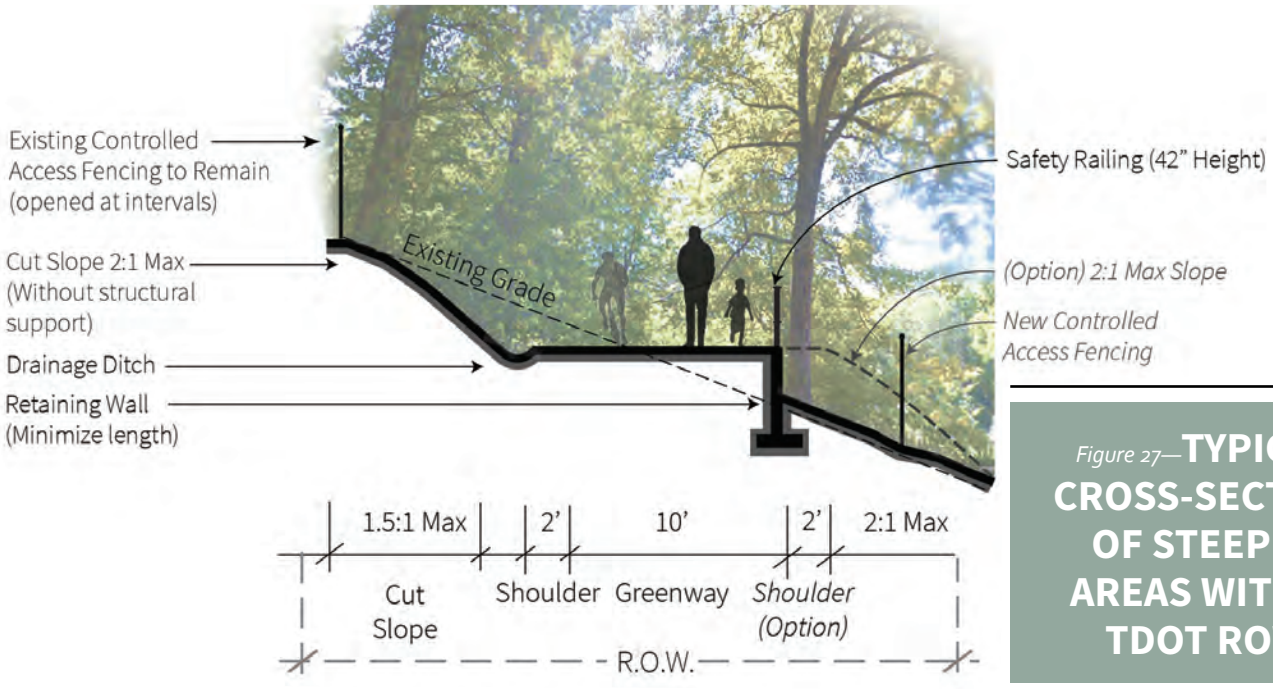


Figure 27—**TYPICAL CROSS-SECTION OF STEEPER AREAS WITHIN TDOT ROW**

Cross Melton Hill Lake Via a Bridge Attachment. One of the greatest barriers to greenway connectivity beyond the study area is Melton Hill Lake and the Solway Bridge, which has a narrow shoulder and no sidewalks. A bridge attachment to accommodate bicyclists and pedestrians is the most feasible option, but will have considerable cost and regulatory challenges. Many federal and state agencies like TVA, the Army Corps of Engineers, and TDOT will need to be involved in the process from planning to permitting (see more about this in the Existing Conditions Section). Considerable funding will need to be sought for construction of the bridge. Immediate planning work should begin to plan for the Solway Bridge crossing, as it may take years to see to fruition. The Solway Bridge is the major reason for leaving this section of the greenway as phase three. Work can be done on this phase while the first or second phases are being designed and built. Figures 30 and 31 provide greater detail on recommended design solutions in crossing Melton Hill Lake .

Current technology in pedestrian cantilevered bridges uses prefabricated FRP (fiber reinforced polymer) decking that attaches to the bridge or can have independent piers. FRP can reduce weight by 10-20% compared to typical concrete bridges. Bridges that may not have been designed for the dead load of concrete attached bridges may be able to accommodate the FRP design (See Figure 30). Coordination with TDOT structural engineers can determine if this solution is feasible.

Phase 3 Recommended Road Crossing Improvements

Road Crossings	*Recommended Type of Crossing*
Solway Road (At Pellissippi Soccer Fields)	Mid-block crossing connects Soccer Fields to Pellissippi State Community College.
Solway Road (Near Greystone Apartments)	Mid-block crossing just north of Greystone Apartments
George Light Road	Intersection crossing with Solway Road
Solway Road near Pellissippi Parkway/ Oak Ridge Highway Interchange	Mid-block crossing with pedestrian island
Guinn Road	Mid-block crossing (near Oak Ridge Highway)
Sparks Road	Mid-block crossing (just east of Solway Ferry Road)

Phase 3: The Northern Corridor (Solway Area/Pellissippi Parkway) Recommended Connections

- **Connect to Pellissippi Soccer Fields**
- **Connect Along Beaver Creek to East Side of Pellissippi Parkway.** This connection could link to Faith Promise Church and single-family subdivisions that are being built on the east side of the Parkway. It would also connect to the future greenway route along Beaver Creek, which has been identified as a regional connection. Another related connection is the office park on the northeast corner of the Parkway and Beaver Creek junction. The office park has an asphalt pathway loop bordering Beaver Creek and might be approached about allowing the pathway to be used as a connection to the greenway by surrounding residential areas.

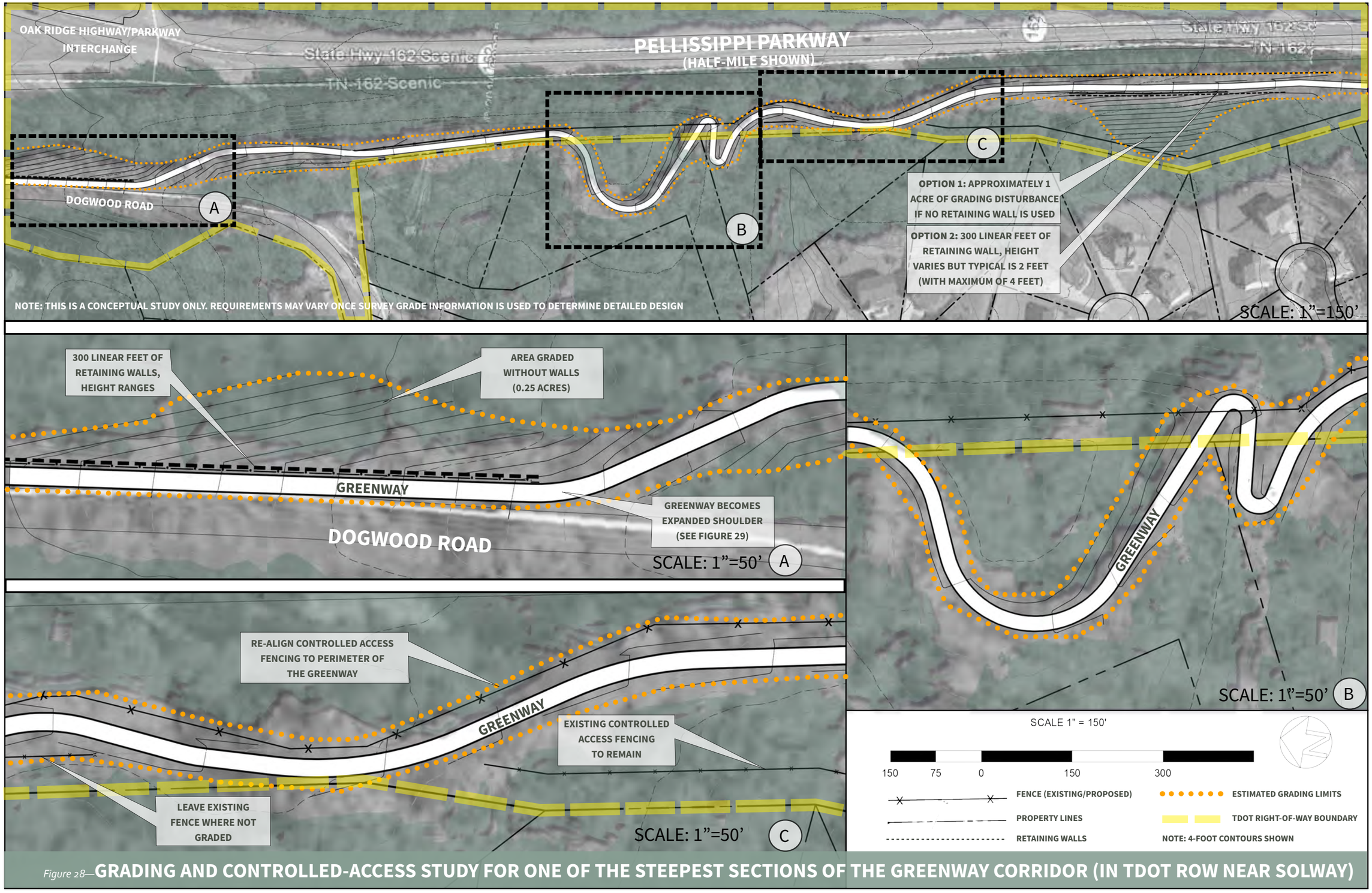
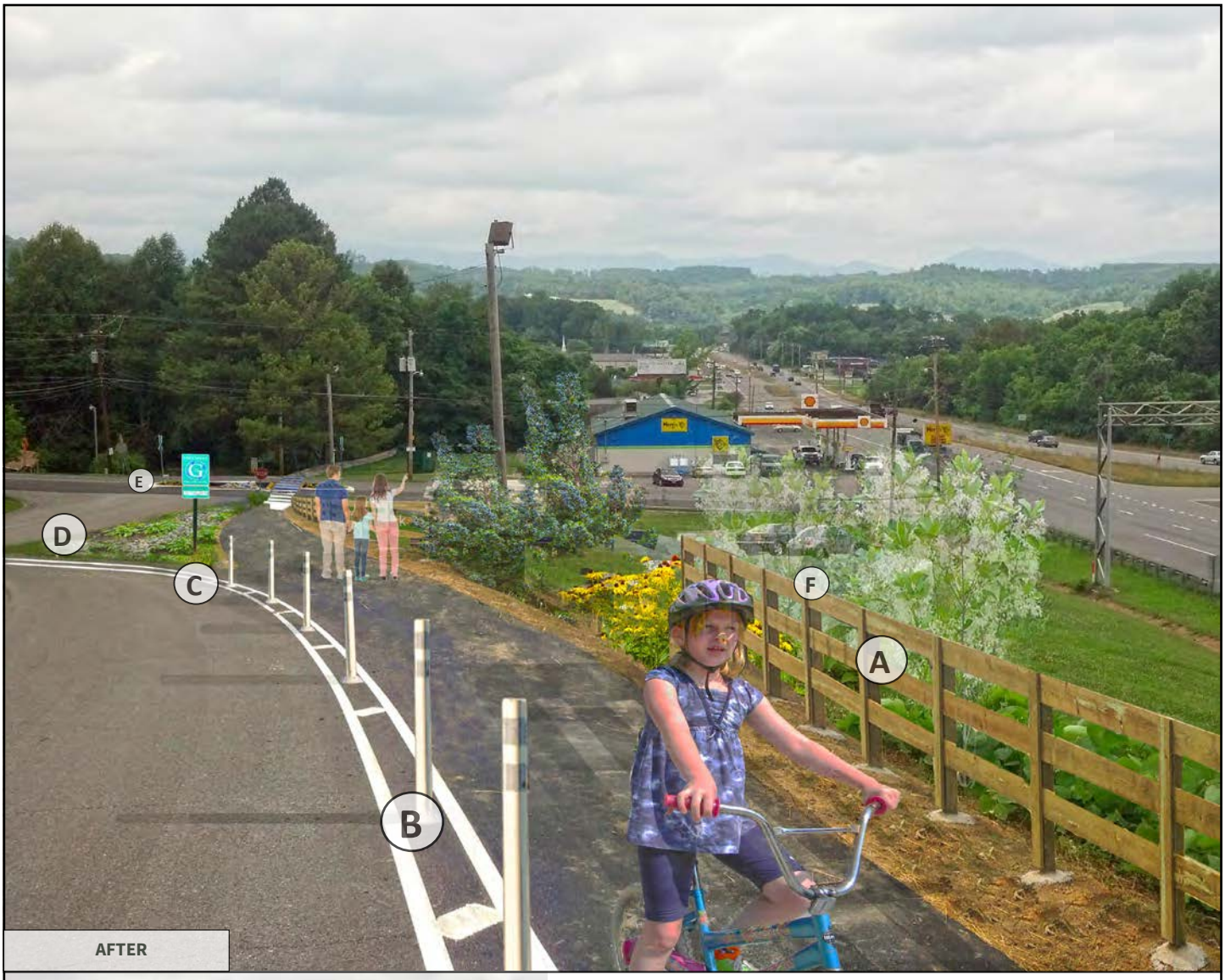
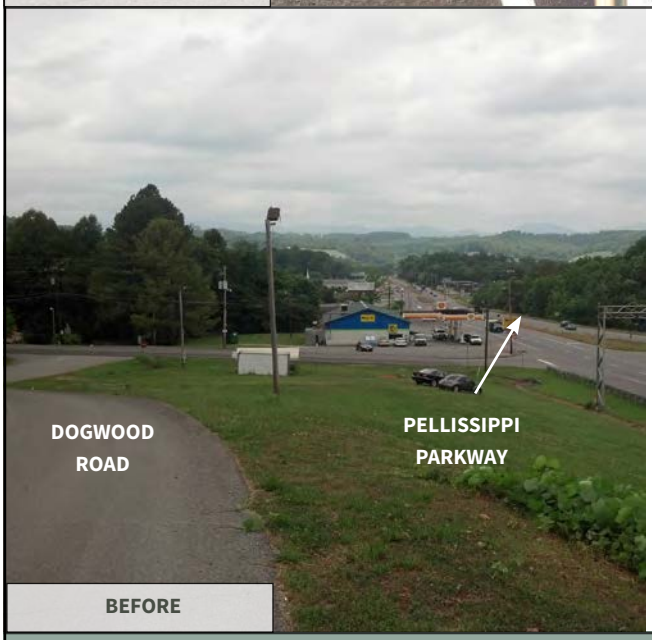


Figure 28—**GRADING AND CONTROLLED-ACCESS STUDY FOR ONE OF THE STEEPEST SECTIONS OF THE GREENWAY CORRIDOR (IN TDOT ROW NEAR SOLWAY)**





(A) Fencing continues up Dogwood Road to tie into required fencing on TDOT ROW. Less expensive fencing options may be used in less visible areas, but areas near the Parkway and trailheads should be more aesthetic. Note that there is a 2-foot minimum (shown here) and 3-foot typical shoulder and clearance area.

(B) Asphalt is extended from road to create greenway with striping. Striping and delineation posts provide a buffer. A grass swale would be an alternative to posts, and could reduce runoff onto the greenway.

(C) Greenway signage provides awareness and wayfinding.

(D) Opportunity for stormwater treatment.

(E) Mid-block crossing with pedestrian island.

(F) Potential trailhead parking (currently in private ownership and not TDOT ROW).

Figure 29—**SOLWAY ROAD/DOGWOOD ROAD IMPROVEMENTS**

Figure 30— Example of a Solway Bridge solution using FRP deck construction. Left example is Tower Bridge in Sacramento.
Image courtesy of Composite Advantage

- **A** FRP bridge attachment uses existing bridge structure. Its lightweight prefabricated decking and rails may potentially be light enough for the existing Solway Bridge to accommodate.
- **B** Bridge transitions to railing at the approach.
- **C** A ramp switchbacks down and under the Solway Bridge.

Figure 31—**SOLWAY PEDESTRIAN BRIDGE ATTACHMENT**

Overall Design Character

Natural Areas

Figure 32—Meadow Treatment
Image Courtesy of Dan Burden

Figure 33—Wooded Area Treatment
Image Courtesy of Equinox

Figure 34—Rest & Interpretive Areas
Image Courtesy of Equinox

Vegetation Enhancements

Figure 35—Stormwater Treatment Areas
Image Courtesy of Equinox

Figure 36—Stormwater Treatment Adjacent to Greenways and Roads

Figure 37—Trailhead "Gateway" Plantings
Image Courtesy of Equinox

Features Used in Steep Grades

Figure 38—Switchbacks with Railing

Figure 39—Retaining Walls and Railing
Image Courtesy of Equinox

Figure 40—Areas Constrained by Steep Grades and Restricted Access *Image Courtesy of www.marinbike.org*

Greenway Features Near Commercial, Schools, and Apartments

Signage, Walls, and Greenway Surface

Figure 41—Adjacent Development's Signage
Image Courtesy of TTCDA Guidelines

Figure 42—Walls Used in Developments Adjacent to Greenway

Figure 43—Regional Wayfinding Signage
Image Courtesy of TPO

Trailhead Features

Figure 44—Trash Cans and Bicycle Racks
Image Courtesy of www.landscapeforms.com

Figure 45—Emergency Call Boxes
Image Courtesy of Boston University Police

Figure 46—Trailhead Kiosk
Image Courtesy of Outdoor Knoxville

Solway Lakefront

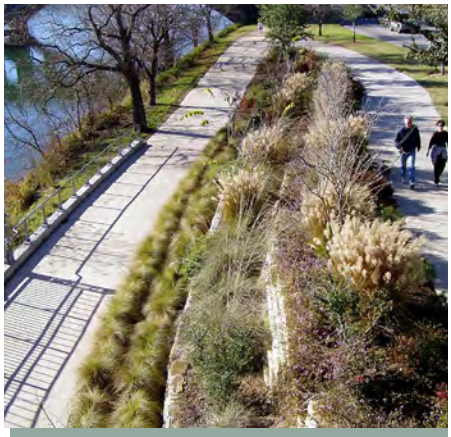


Figure 47—Waterfront Landscape Features
Image Courtesy of Dan Burden

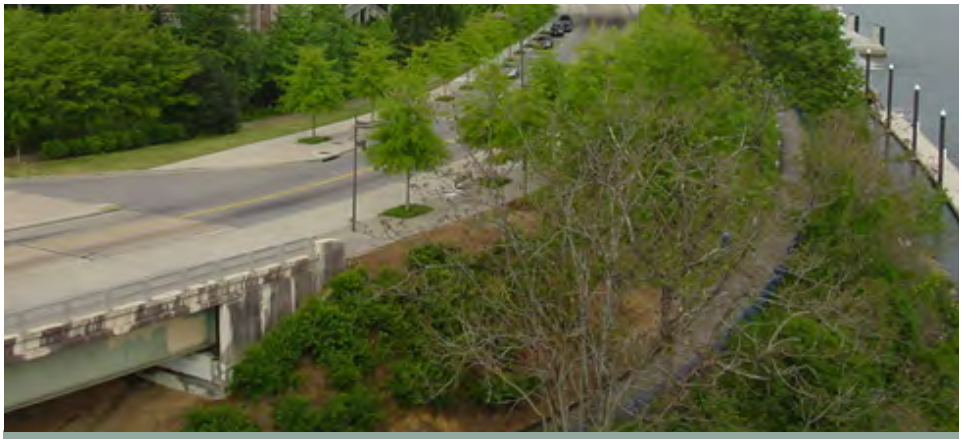


Figure 48—Waterfront Greenway Using a Bridge Underpass
Image Courtesy of Equinox