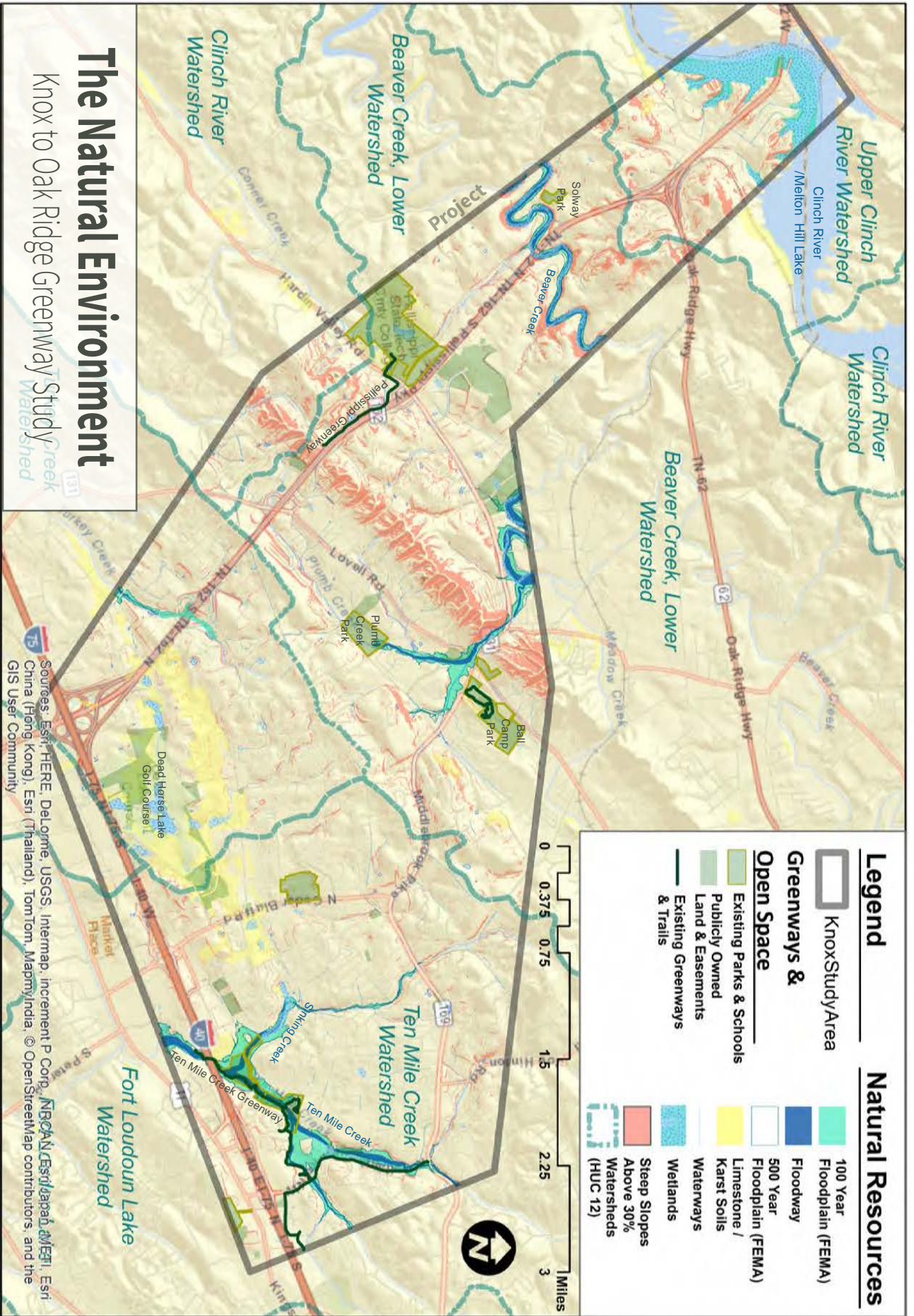


# Section II

## Existing Conditions of the Corridor





# The Natural Environment

## Knox to Oak Ridge Greenway Study

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri/Japan, Esri, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# The Natural Environment

## Floodplains and Greenways

This study looks at a greenway corridor that passes through the floodplain of several water bodies, including Ten Mile Creek, Turkey Creek, Beaver Creek, and Melton Hill Lake. Floodplains can have some advantages and disadvantages for greenway corridors. Development is regulated within the floodplain, preserving continuous undisturbed natural areas great for greenways and wildlife. Intact floodplains are key to dissipating flooding, but can also be destructive to greenways that are not properly built within them. Because of reoccurring flooding, regulations of the floodplain, and alterations of natural hydrology, any future greenway design should have a minimum impact by following these guidelines:

- **Consider permit requirements within the 500-year floodplain.** Knox County requires a Floodplain Development Permit if any alteration occurs within the 500-year floodplain. Additionally, Stormwater Management Plans will be required.
- **Minimize disturbance in the floodplain and avoid the floodway.** Any construction within the 100-year floodplain will require a permit. Future greenway structures should avoid the floodway, as shown in the Opportunities and Constraints (OC) maps. Floodways are regulated heavily by both Knox County and the Federal Emergency Management Agency (FEMA)<sup>1</sup>. Fill, structures (walls, kiosks, etc.), and impervious surfaces are discouraged. Any structure located within the floodway requires a no-impact / no-rise study through FEMA. These studies range from \$5,000 to \$15,000 depending on complexity.

Bridges or structural additions within the floodway require a no-rise study. A no-rise study uses stream modeling to reflect changes in upstream water levels during flood events as a result of proposed construction in the floodplain. If there is no increase in the water depth of the 100-year storm, a permit can be approved. If the disturbance causes a rise, then a FEMA CLOMR (Conditional Letter of Map Revision prior to construction) and LOMR (Letter of Map Revision done post construction) are required. Both of these steps significantly increase costs and add time to the project.

## Streams, Ponds, Lakes

There are many water bodies within the study area that are regulated by the County, State, and Federal governments. Some of the main considerations in future planning and design are:

- **Maintain a 50-foot buffer from all streams** (as defined by Knox County). Knox County stormwater regulations require a 50-foot buffer along all streams. The buffer area is measured from the top of the bank. Trails and greenways are allowed within this buffer if they are unpaved or have a pervious surface<sup>2</sup>.
- **Plan for Aquatic Resources Alteration Permits (ARAP).** ARAPs and possibly Section 401 permits will likely be required in cases where any stream alterations occur. These alterations would be most likely in conjunction with bridge improvements or the addition of structures near waterways.
- **Consider that future modifications of the Solway Bridge will likely require Section 9 and 10 permits as part of the Rivers and Harbors Act.**

## Sinkholes / Karst Areas

Sinkholes and karst areas are widely occurring in the southern portion of the study area. The OC Maps 1 and 2 indicate wide swaths of limestone/karst geology. Additionally 4-foot contours (not shown in the OC maps) indicate more precise locations of potential sinkhole areas. Sinkholes have created flooding issues in the past in this area, and care should be taken in the design phase not to increase flooding. Stormwater runoff from surrounding development and

1 Knox County Ordinance for Stormwater Management, Ordinance No. O-07-12-101, Knox County, TN, 2014

2 Chapter 6 Water Quality Buffers, Stormwater Ordinance, Knox County TN Stormwater Management Manual, 2008

the future greenway have potential for transmitting stormwater into interconnected groundwater systems that are discharged at springs. If stormwater exceeds the discharge of these springs, flooding can occur. The following should be considered in the design phase:

- **Determine 100-year floodplain for sinkholes and design around them.** Sinkholes have a 100-year frequency storm event. Many of these are documented by Knox County in the Dutchtown Road area<sup>3</sup>. This information should be utilized in future greenway design. Knox County requires geotechnical studies within 50 feet of the rim of the sinkhole. A floodplain permit through Knox County may be required if construction occurs.
- **Design using best practices for sediment control.** During the design and construction phase, sediment control and water runoff measures should be taken to minimize the amount of water or sediment that drains to a sinkhole. Stormwater has chemical properties that can accelerate the decomposition of limestone and increase chances for sinkhole formation.

## Wetlands

Several wetlands on the National Wetland Inventory (NWI) are within the study area as indicated in the OC maps. Most notably, larger wetlands appear to exist along Ten Mile Creek, near the Dead Horse Lake Golf Course, and in the Melton Hill Lake area. Other small patches are located throughout. Guidelines for wetlands include:

- **Delineate future wetlands as part of corridor design studies.** NWI does not always pick up wetlands, so in future studies a survey of property should delineate any potential wetlands prior to design.
- **Avoid impacts to wetlands.** If wetland impacts occur, a Section 401 certification through the U.S. Army Corps of Engineers (USACE) is required and the State is involved in 401 certification in partner with USACE.
- **Define a 25-foot buffer for wetlands.** Knox County requires a 25-foot buffer from wetlands in which no disturbance should occur.

## Steep Slopes

The steepest slopes begin in the middle section of the study area and primarily occur in cut areas surrounding the Pellissippi Parkway, Beaver Ridge, and drainages into Melton Lake/Clinch River. As a standard, greenways should be designed for vertical grades less than 5% to make them accessible for people of all abilities. In these steeper areas, this will be a design challenge. These accessibility constraints were considered when designing trail alignments and may require greater land use in order to achieve acceptable trail grades. Slopes above 30% are indicated in the OC maps.

## Tennessee Valley Authority (TVA) Lands

TVA requires a Shoreline Construction Permit (26a permit) that may apply to the areas surrounding Solway Bridge. This permit applies to construction within the 500-year floodplain. TVA owns land (highlighted in seven different colored land uses) as shown in Figure 2. TVA's policy considers leasing or granting limited easements of land for public recreation if the property is designated in a reservoir land management plan, in which case a standard application and "phased" review process is required. This process determines amount of public support, assesses plans, and may require environmental compliance (threatened and endangered species report, cultural resources survey, etc.)

As part of TVA's land use policies, land use zones have been developed that classify appropriate uses for each zone. The areas surrounding Solway (as shown in Figure 2) are largely natural resource conservation and residential development. These land uses may be more compatible with a greenway than lands zoned Sensitive Resource Management, but compatibility will ultimately be determined through the permitting process.

3 Dutchtown Flood Study- Knox County Tennessee, OGDEN, 1996

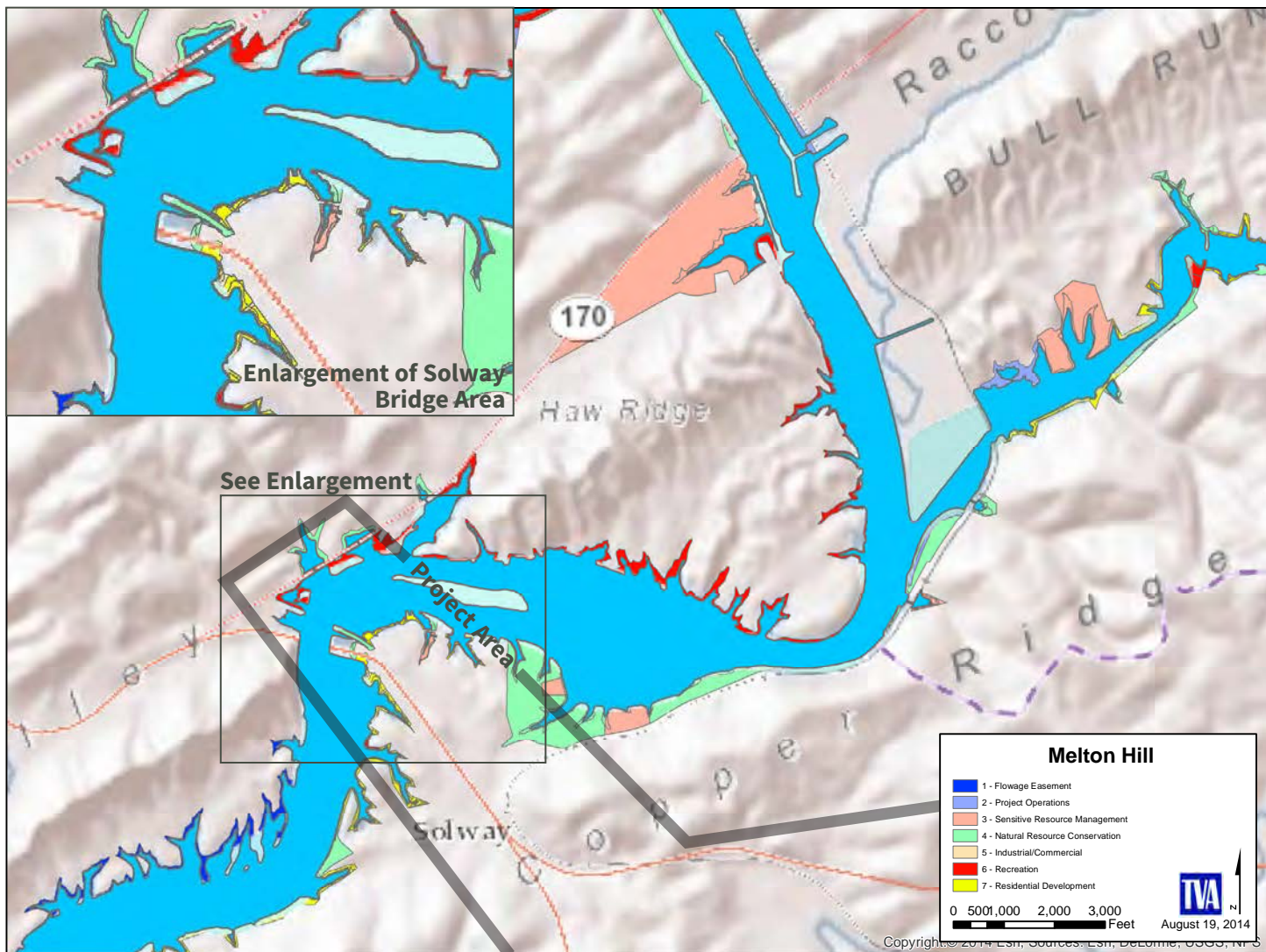
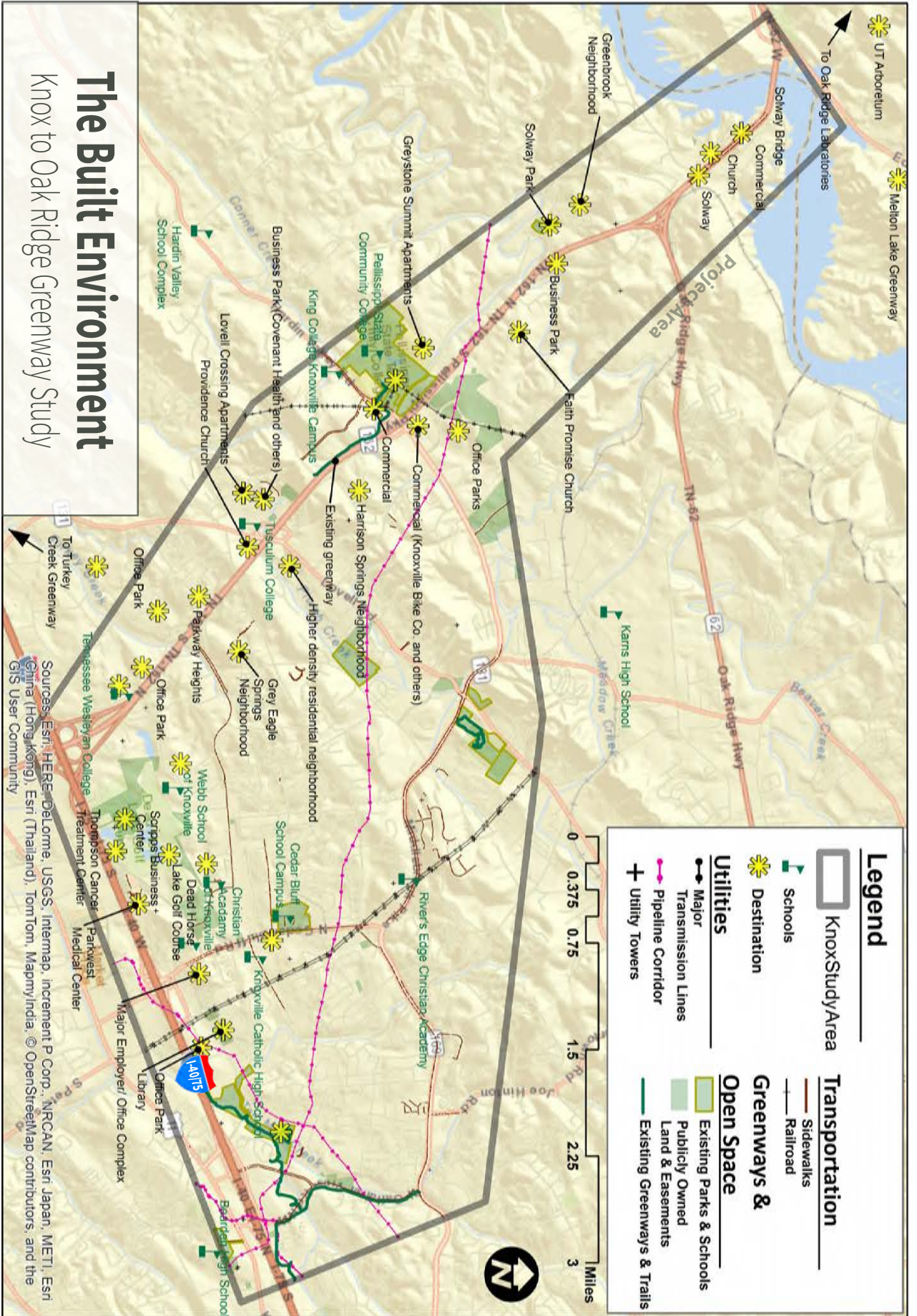


Figure 2—Map of TVA Lands (Highlighted By Colors) and Land Use Zones Surrounding the Solway Bridge Area, Map Courtesy of TVA, 2014

## Threatened and Endangered Species

The State of Tennessee documents more than 37 species listed in the rare species database that occur in watersheds within the project area. These watersheds include Beaver Creek Lower, Turkey Creek, Ten Mile Creek, and Clinch River/ Corner Creek. The table of species occurrences is available in Appendix C. In design and construction phases, future exploration should be taken to determine potential impact. Greenway construction that uses federal money or that engages TVA land would trigger the need to further determine any impact to the species listed. It is important to note that several federally listed species occur in the Clinch River/ Corner Creek watershed, which relates to the most northern portion of the study area near Solway and Melton Lake/Clinch River.



# The Built/Human Environment

## Utilities

The study area has a complex matrix of utilities including transmission lines, gas pipelines, utility towers, and sewer infrastructure. Major utility corridors are indicated on the Opportunities and Constraints (OC) maps. It is important to note that the maps do not include minor utility lines, many of which were observed in site visits. Where a potential greenway alignment may be likely, site observed utilities are noted in the maps. Municipal sewer lines are also included in the OC Maps.

## Transportation

Several aspects of the existing transportation network were analyzed in the study area, including TDOT right-of-way (particularly as it relates to Pellissippi Parkway), planned improvements, existing access across the Parkway, existing on-street bike and pedestrian infrastructure (crosswalks, bike lanes, etc.), railways, and existing greenways. Following are some existing conditions that will help identify opportunities and challenges for development of a greenway.

### The Pellissippi Parkway

The Parkway is both an opportunity and barrier to greenway development. While it restricts travel and connectivity, it also has useful right-of-way widths in some areas, and has existing infrastructure like bridges that may serve as access across the Parkway or waterways. Crossings that were not on grade were analyzed for existing and potential improvements for greenway connection or alignment:

Pellissippi Parkway Crossings	Existing or Potential for Pedestrian / Bike Infrastructure and Connectivity	Future DOT Planned Improvements
<b>Dutchtown Road Bridge</b>	No sidewalk or shoulder on bridge over parkway. Sidewalks terminate on eastern part of interchange ramps.	Yes, interchange reconstruction
<b>Bob Gray Road Bridge</b>	The Bob Gray Road bridge has an approximately 8-foot shoulder on one side and an approximately 5-foot shoulder on the other side, in addition to the 10-foot travel lanes.	No
<b>Lovell Road Underpass</b>	Lovell Road is the only crossing in which completed sidewalks exist on one side. Parts of Lovell Road have bicycle lanes, including the interchange area.	Yes, interchange reconstruction
<b>Hardin Valley Road Underpass</b>	There are no sidewalks on this portion of Hardin Valley Road, but the signalized stops for the exit and entrance ramps both have crosswalks.	Yes, interchange reconstruction
<b>Beaver Creek Bridge</b>	This bridge carries the Parkway over Beaver Creek. There may be potential to add an underpass to connect the greenway under Pellissippi Parkway.	No

A meeting with TDOT on August 8, 2014, established criteria and standards to consider in the planning and design phases for the greenway. The meeting both established further details on existing conditions, provided recommendations on design solutions, and outlined planned improvements within the Pellissippi Parkway Corridor. The results of this meeting are in Appendix B.

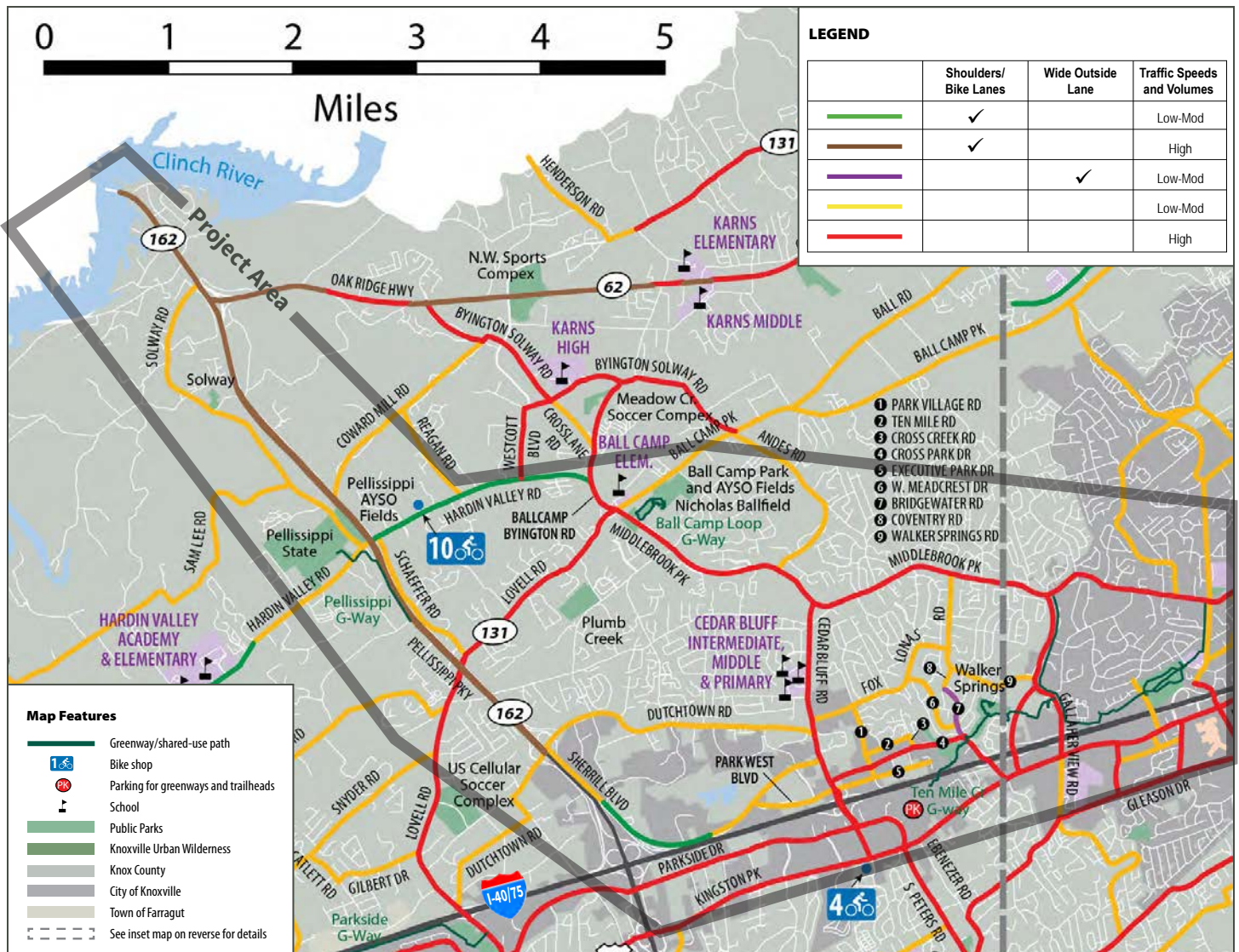


Figure 3—Knoxville/Knox County Bicycle Map, Knoxville Regional Transportation Planning Organization, 2014

## Rail

Rail corridors were not analyzed as a potential greenway corridor for this study because the existing rail in the northern part of the project area is active and located away from the higher densities of housing and commercial areas.

## Existing Pedestrian and Bike Infrastructure

Sidewalks are shown on the OC map and should be considered as key connectors to the greenway. Field visits indicate that not all sidewalks are represented in the OC maps. A Knoxville Regional Bicycle Program map evaluates routes for bicycle travel. Figure 3 shows an excerpt of the program map. Crosswalks are designated as opportunities within the OC maps.

## Walkability and Schools

Knox County Schools identifies Parent Responsibility Zones (PRZs) surrounding schools, which designate the areas surrounding a school where children are not eligible for bus service. These areas range from 1 to 1½ miles depending on age (see Figure 4 for PRZs). This study examines how the future greenway can serve as a connector to at least some of the PRZs and schools. The greenway and proposed connectors can become significant and safe routes for walking and bicycling in these zones.



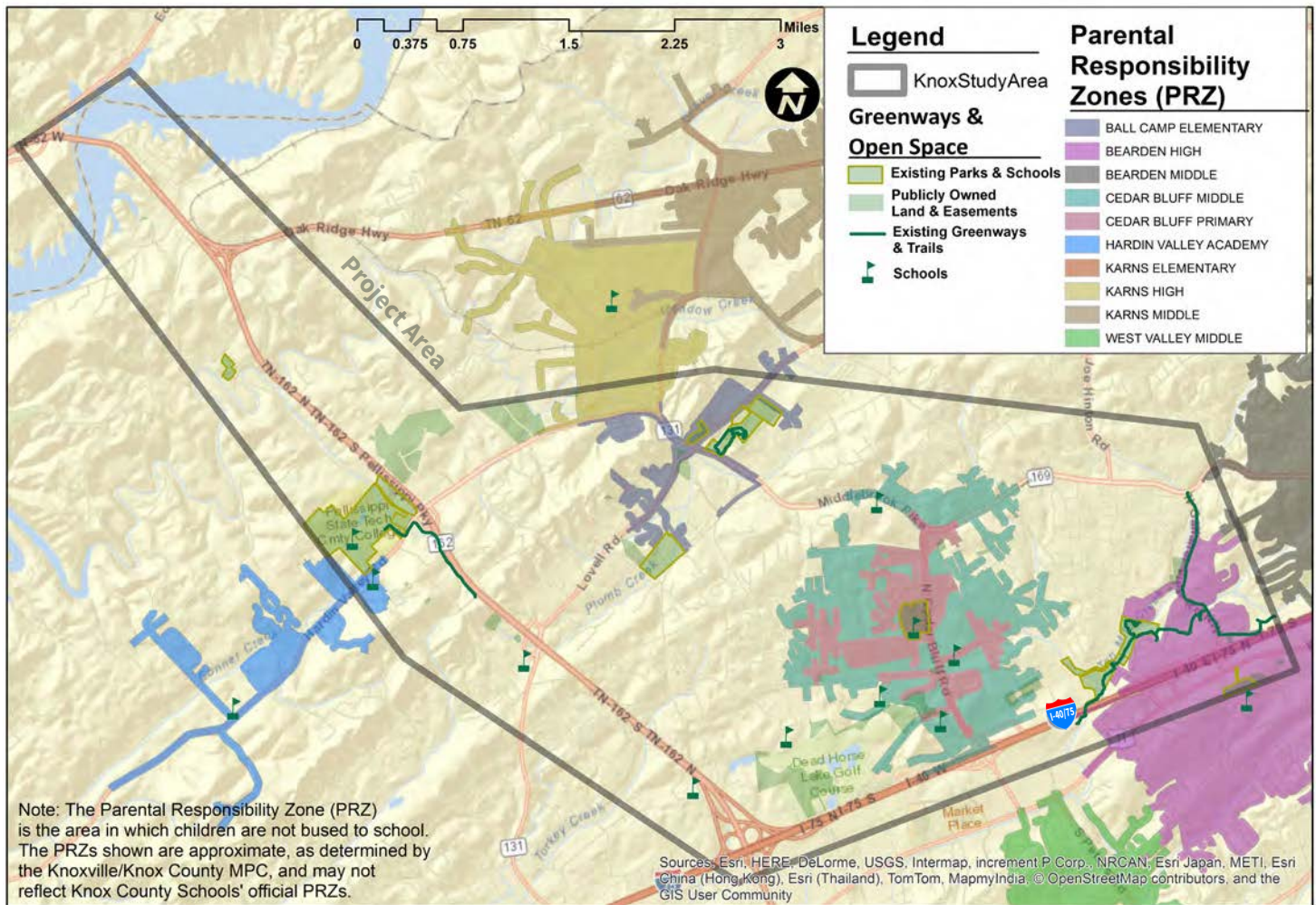


Figure 4—Parental Responsibility Zones (PRZs), Knox County, 2014

## Connecting to Landmarks and Destinations

Input from the Technical Advisory Committee, public workshops, and online public surveys (see Appendix D) defined major destinations that the greenway should connect to. These spurs could be either greenways or other pedestrian/bike infrastructure. Some of the most mentioned points of connection include:

- The City of Oak Ridge
- Oak Ridge National Laboratory
- Public and Private Schools—specific schools called out are the Hardin Valley School Complex, Knoxville Catholic High School, the Cedar Bluff School Campus, Christian Academy of Knoxville, Ball Camp Elementary, and the Webb School.
- Melton Lake Greenway / Haw Ridge Park
- Solway Community
- Pellissippi State Community College
- Lovell Road
- U.S. Cellular Soccer Complex
- Turkey Creek Greenway and Farragut greenway system
- Ten Mile Creek Greenway and the Knoxville greenway system
- Parks—specifically Plumb Creek Park
- Beaver Creek

The Built Environment Map, the Opportunities and Constraints maps, and the Corridor Design maps will convey locations of these landmarks.

## Existing Greenways and Parks

One of the major goals of this study is to connect two existing and one planned greenway:

- *Ten Mile Creek Greenway*—This greenway is on the eastern border of the study area and is currently being planned to connect into the main spine of Knoxville’s greenway system.
- *Pellissippi Greenway*—This greenway is in the middle of the corridor study area and spans just over a mile. The greenway was built within Pellissippi Parkway TDOT right-of-way.
- *Melton Lake Greenway*—This greenway is planned to link into the study area when improvements of Edgemoor Road occur. The existing Melton Lake Greenway travels through Haw Ridge Park and along Melton Lake outside of the study area.

Additional future greenways and parks are planned in this study area and have been identified in the Knoxville-Knox County Park, Recreation, and Greenways Plan as shown on the map on the following page.

## Housing, Employment, and Land Use

One of the goals of this study was to connect higher densities of housing and employment clusters. Figure 5 shows these concentrations of housing and Figure 6 shows the clustering of employment centers. Areas surrounding the Parkway are zoned Commercial and Business Technology Park with the majority of the Parkway corridor in a Technology Corridor Overlay. Lower Density Residential surrounds the areas further out from the Parkway and I-40/75. Multi-family housing is also seeing growth in the area surrounding Pellissippi State Community College and exists around Ten Mile Creek.

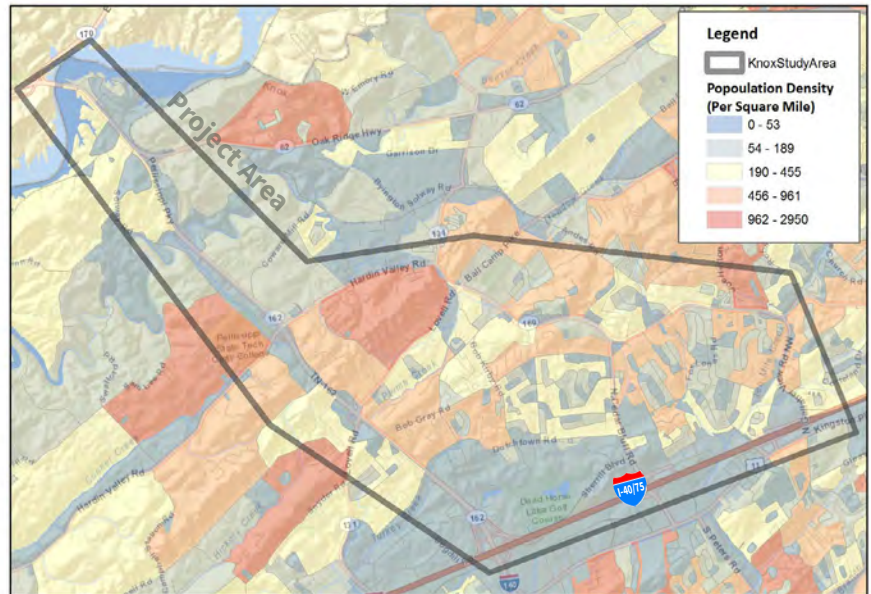


Figure 5—Concentration of Housing (Population Density Per Square Mile), US Census Data, 2012

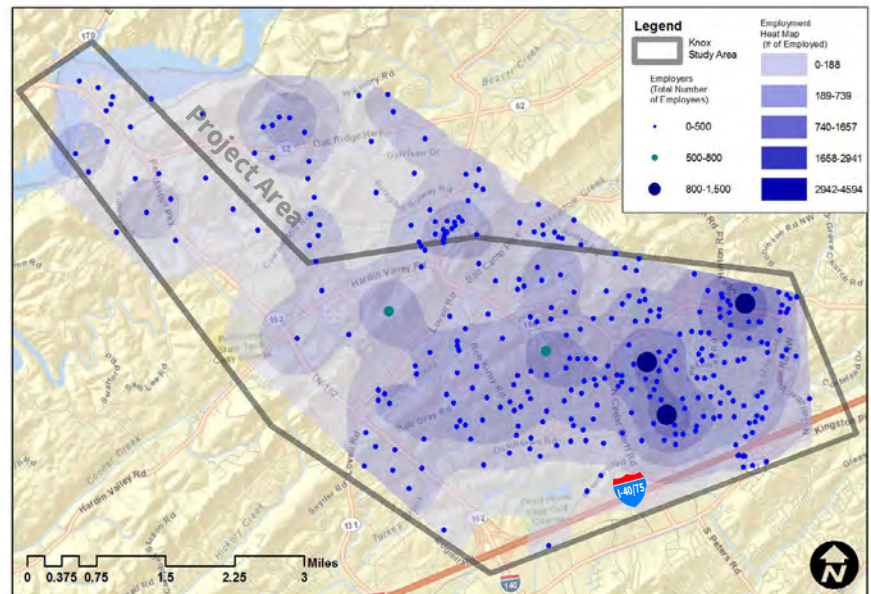
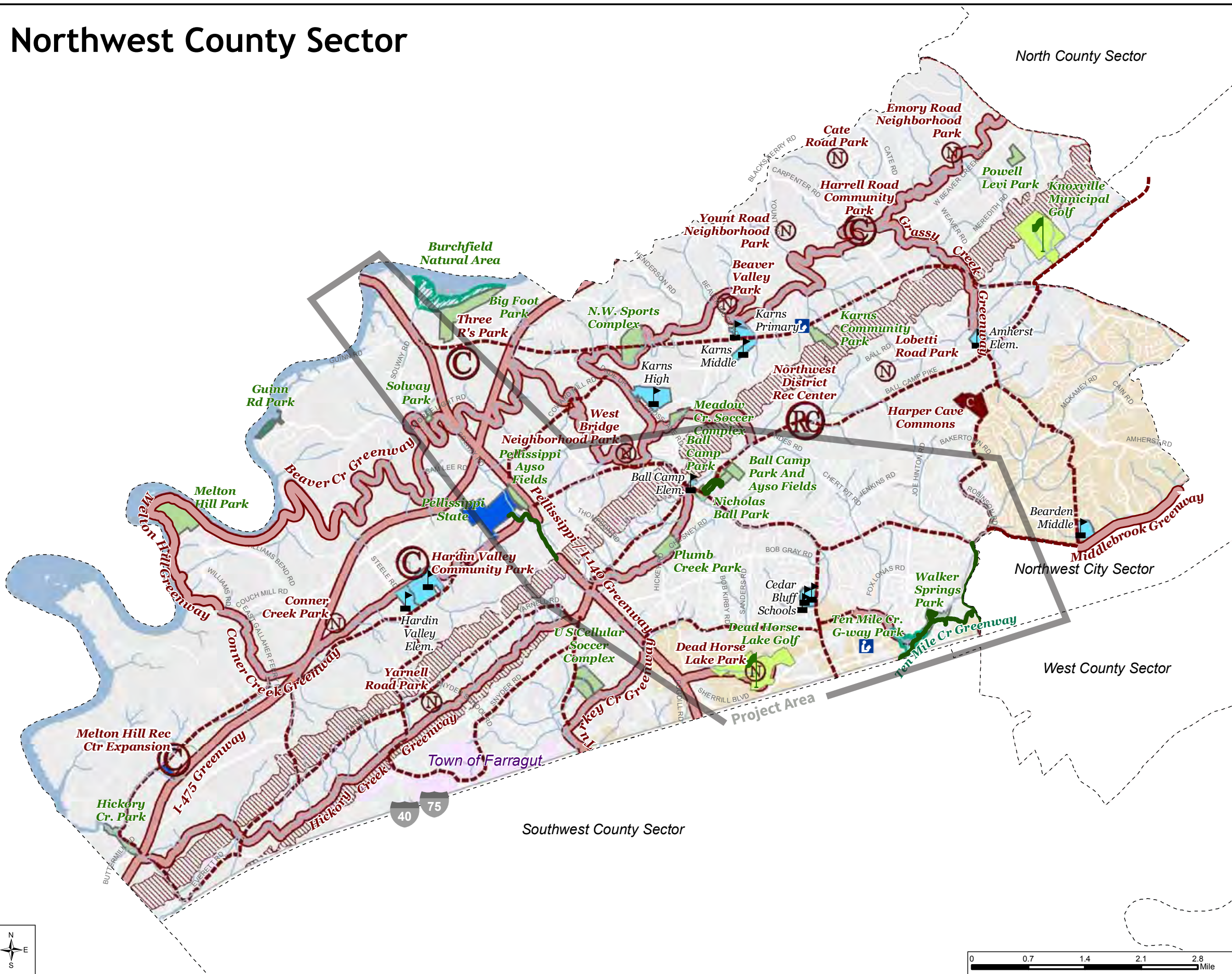


Figure 6—Concentration of Employment Centers (Per Square Mile), US Census Data, 2012

This page left intentionally blank

# Northwest County Sector



### Park and Greenway Proposals

**Proposed Parks: General Vicinity**

- (N) Neighborhood Park
- (C) Community Park
- (D) District/Regional Park
- (RC) District Recreation Center

---

**Proposed Parks: Specific Location**

- Neighborhood Park
- C Community Park
- D District / Regional Park

---

**Proposed Greenways and Blueways**

- Greenway
- Greenway Connector
- Ridge Conservation Corridor
- Blueway Access Location

---

**Existing Park Facilities**

- Community and District/Regional Parks
- Neighborhood Park
- Open Space / Natural Area
- Private/Quasi-public Parks
- Golf Courses
- School Parks
- Public Recreation Center
- Quasi-public Recreation Centers
- Greenways
- Blueway Access Location
- Blueway Rest Stop

---

**Other Information**

- Libraries
- Streams
- City of Knoxville Boundary
- Planning Sector Boundary

## Knoxville- Knox County Park, Recreation, and Greenways Plan

2009

