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# The North Shore Greenway Feasibility Study

CHATTANOOGA & RED BANK | 2018 |



RAGAN • SMITH





# The North Shore Greenway Feasibility Study: Phase 1

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Thanks to the following foundations who helped fund this study:





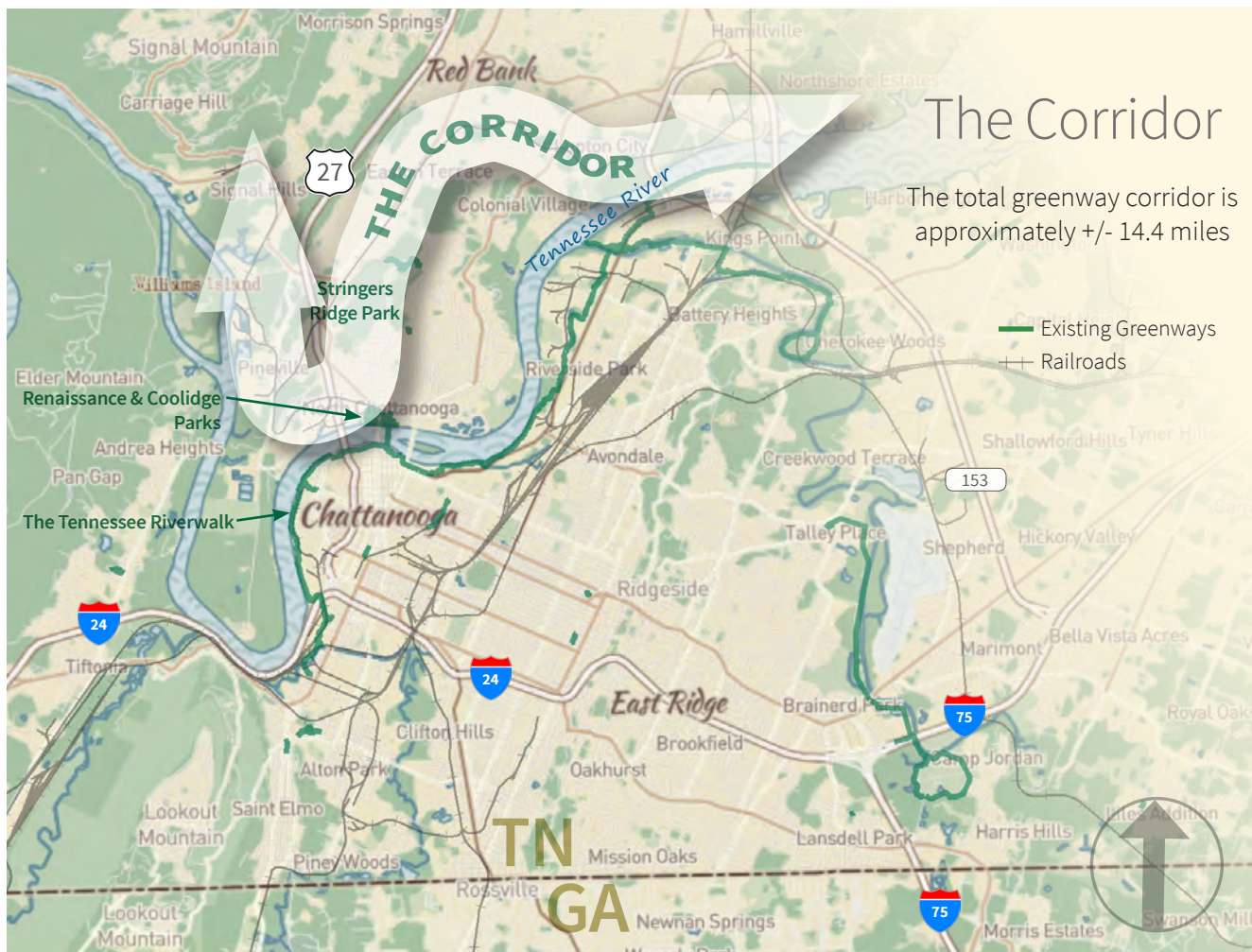
# Introduction

## Background

### How did we get here?

In 2015 the study funded by Causeway, *Connecting Chattanooga Neighborhoods by Rail-Trail: An Examination of Corridors*, the Rails-to-Trails Conservancy identified over 150 miles of potential rails-with-trail or rail-trail corridors. In the study, the North Shore Greenway was identified because it would break down significant barriers to bicyclists and pedestrians, including Highway 27, Stringers Ridge, Stringers Ridge Tunnel through the ridge, and Hixson Pike. It will improve connectivity from North Shore to Red Bank, north to the base of Signal Mountain, and east to North Chickamauga Creek Greenway.

A steering committee of trail advocates and representatives of local governments and foundations came together to see if a greenway opportunity existed. The North Shore Greenway was proposed to have two phases, the first to analyze the feasibility of the project, and the second as a conceptual plan of the preferred alignment identified from the feasibility study in phase one.



## The Vision

The steering committee developed the goals (seen to the right) for which the vision for this corridor and a future greenway was based upon:

The North Shore Greenways will be a **multi-use connection for transportation and recreation, connecting the North Shore**, the gateway to **Stringers Ridge, Red Bank, and Lupton City**. This corridor will provide a **safe and attractive amenity that spurs economic development and better connects neighbors**.

## About This Plan

This plan is intended to be a two-phased plan. Phase one is intended to look at whether or not a greenway corridor is feasible to connect the places shown on the map to the left. Phase one establishes a strategy on what potential corridors can be used while phase two will develop the preferred alignment (chosen by the steering committee) further into a conceptual plan that illustrates pertinent design details, as well as potential cost, and input from the public.

The Norfolk Southern Railroad right-of-way was analyzed in addition to looking at connecting to the Tennessee Riverwalk, major destinations like Renaissance and Coolidge Parks, Stringers Ridge Park and the multiple other parks in the North Shore area. This plan also looks at opportunities to connect to Dayton Boulevard as a major commercial destination, and to schools, and centers of employment.

In total, the greenway will be around 14.4 miles. Naming of the greenway and its parts will be done after this study, but should include an overarching brand and unifying design elements.

## Goals of the Greenway

### TOP PRIORITY GOALS:

- **Connect via a greenway the North Shore area, Red Bank, Signal Mountain Road area, and North Chickamauga Creek Greenway**
- **Fill bike and pedestrian network gaps and increase transportation options**
- **Stimulate economic development, redevelopment, and tourism in local communities**
- **Connect people to major attractions: schools, parks, the workplace, etc.**
- **Build community and create opportunity for social interaction**
- **Create and connect to recreational opportunities**
- **Improve health of the community**

### WHAT THIS PLAN AIMS TO ACHIEVE:

- **Find funding for the plan**
- **Provide an alternate connection to the Tennessee Riverwalk**
- **Determine if a greenway corridor within railroad ROW is feasible**
- **Design a greenway that is convenient to use**
- **Design a greenway that accessible to all abilities**
- **Design a greenway that is low maintenance**





CHAPTER

1

*Summary of Relevant Plans*



# Impetus for This Plan

Several studies spurred an interest in looking at opportunities to connect the North Shore area via a greenway system. The vision, which has been reiterated in several plans, envisions the following connections:

- Connect Renaissance and Coolidge Park along the Tennessee River to the foot of Signal Mountain.
- Connect the North Shore to Red Bank.
- Connect the North Shore east, into North Chickamauga Creek Greenway.

The following is an outline of the studies that were an impetus for this plan:

## The Rail-Trail Study

### Connecting Chattanooga Neighborhoods by Rail-Trail: An Examination of Corridors(2015)

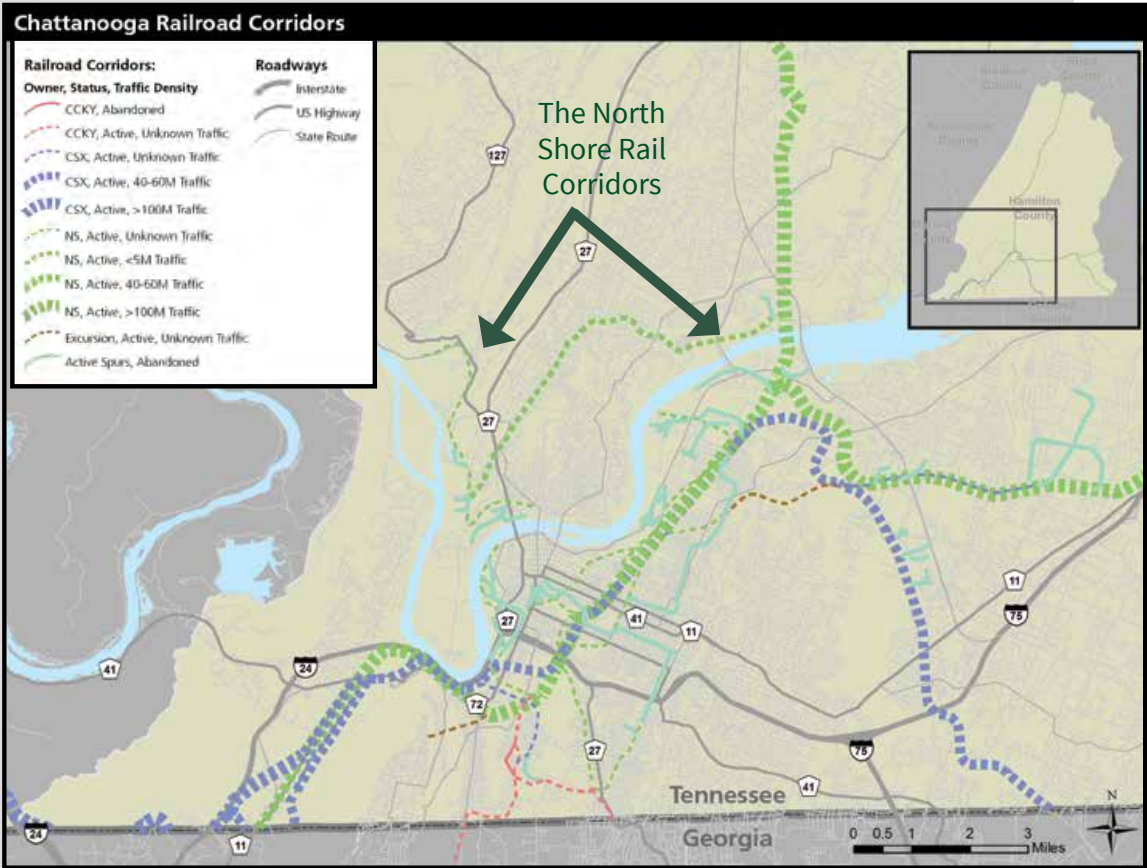
Since extant rail rights-of-way often offer an untapped resource for expansion of bicycle and pedestrian facilities, the intent of this study was to explore potential re-purposing of Chattanooga’s rail rights-of-way for use as automobile-free venues for transportation and recreation. This preliminary assessment was provided to the Chattanooga \ DOT for integration into the Chattanooga Bike Facilities Plan and implementation program. Findings of the Chattanooga study include:

- There are 190 miles of Hamilton County rail corridor (active, unused and abandoned)
- The 2014 Chattanooga Bike-Pedestrian Plan implementation program expressed an intention to double the number of greenway miles from 19 miles to 37 miles within the ensuing three year or so period, and indicated hope that more Rails-with-Trails projects could eventually raise the total greenway length above 100 miles
- The 2014 Chattanooga Complete Streets ordinance promotes both Rails-with-Trails and Rails-to-Trails projects
- A Chattanooga Multi-Modal Transportation Center study was underway at the time

The 190 miles of (active, unused, and abandoned) rail corridor in Hamilton County have been mapped and characterized based upon the following criteria:

- Status (active, unused or abandoned)
- Width of right-of-way
- Owner
- Service type (freight, passenger or both)
- Frequency of train use
- Development density surrounding each corridor

Of 12 potential corridors which emerged as prime candidates for development of bike-pedestrian facilities, a corridor within North Shore was listed as top priority. The proposed greenway runs from North Shore to North Chickamauga Creek Greenway from Renaissance Park, five miles along an active NSRR corridor through Browns Gap, past Baylor School to Signal Mountain Road (near the Walmart and Food City) and / or to Portland Park via Pineville Road and another six miles down West Elmwood Drive to Red Bank (Dayton Boulevard and parallel route) corridors and then Lupton Drive to Lupton City as well as ultimately to the North Chickamauga Creek Greenway with a potential crossing of C.B. Robinson Bridge to connect with the Tennessee Riverpark as well as a potential future connection to a proposed Mountain Creek Greenway.



## North Shore Public Spaces Study

### North Shore Public Spaces (NSPS) Study (2007, updated 2016)

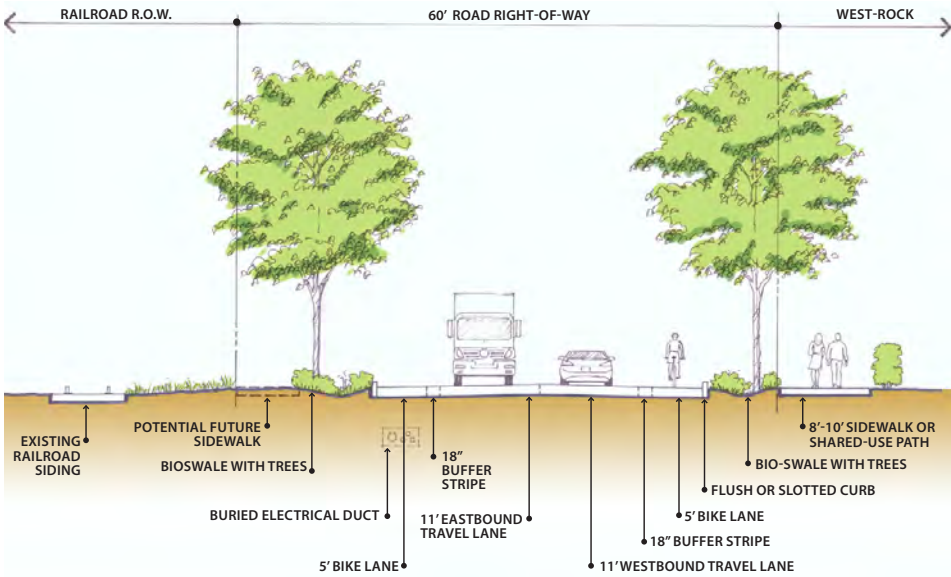
This plan is the result of a decade-long comprehensive planning process. Initiated by the Regional Planning Agency (RPA), the agenda for the NSPS study was to create an effective means of connecting the increasingly active North Shore area with a proposed Gateway Site (visitor center) for the Moccasin Bend National Archaeological District (MBNAD) via the establishment of a more appropriate “gateway corridor” which would serve that purpose. Design criteria and standards used elsewhere by the City of Chattanooga were incorporated into the NSPS study where applicable.

The plan is a blueprint for development of this study area going forward. Four objectives were presented as goals for the NSPS study:

1. Creating an enjoyable and attractive multi-modal travel experience to and from the MBNAD Gateway Site to the North Shore and other area destinations;
2. Enhancing North Shore as a place to live, work and recreate;
3. Revealing historical context and other special qualities of the Gateway Corridor; and
4. Promoting environmental sustainability throughout the area.

Four elements were identified in the resulting NSPS study plan:

- The Manufacturers Road / Hamm Road backbone as the primary corridor;
- Extending the North Shore Riverwalk from Renaissance Park to the Gateway Site;
- A new street connection between Manufacturers Road and Cherokee Boulevard; and
- Manufacturers Park.

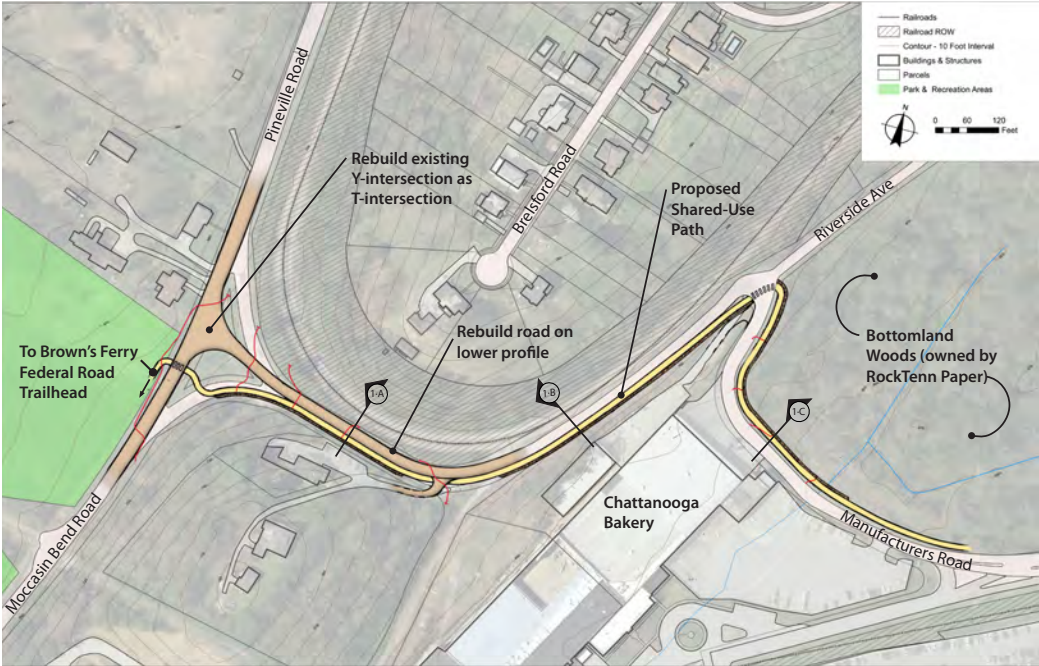




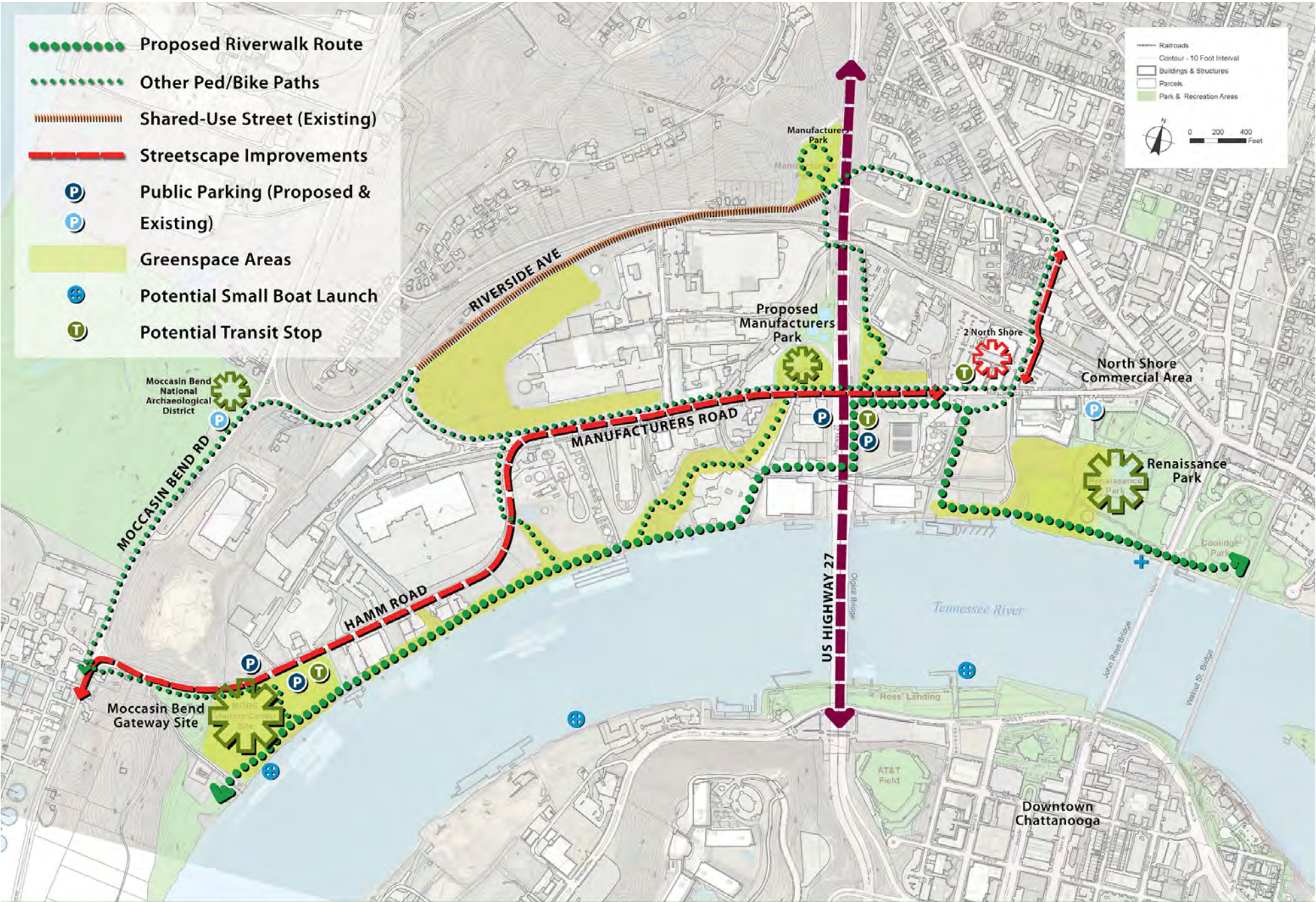
North Shore Public Spaces Study (cont.) The figure to the right presents a plan for the NSPS Study area. A summary of recommendations from the plan include:

- A **shoreline Riverwalk corridor extension** from Renaissance Park under US 27 to the Gateway Site and beyond.
- **Streetscaping along Manufacturers Road** under US 27 and on to Hamm Road
- **A dedicated shared-use (bike-ped) path along the north flank of Manufacturers Road** under US 27 and to both Riverside Avenue on the north (from there along Riverside Avenue through Browns Gap to the Browns Ferry / Federal Road Trace parking area) and a Hamm Road crossing on the south
- **A shared-use street** from Cherokee Boulevard along the Manning Street-Whitehall Road-Riverside Avenue corridor and on to the Manufacturers Road intersection
- **If Riverside Avenue can actually be re-constructed as a separated, dedicated shared-use path** from Manufacturers Road through Browns Gap to the point where a crosswalk would connect with the Browns Ferry / Federal Road Trace parking area.

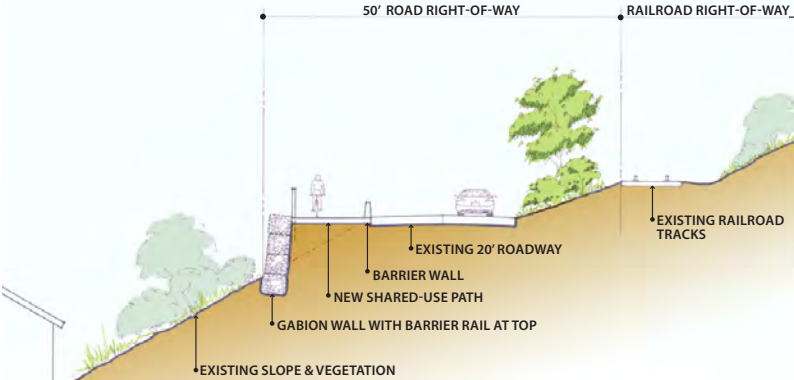
Below are some of the exhibits developed in the study to indicate how some of the future connections could look. This study will evaluate these recommendations but in some cases may differ on what a connection might look like in profile.



ROAD & PATH IMPROVEMENTS AT BROWN'S GAP - ALT. 1  
NORTH SHORE PUBLIC SPACES



INTEGRATED CIRCULATION & ACCESS PLAN  
NORTH SHORE PUBLIC SPACES



# SUMMARY OF RELEVANT PLANS



# Chattanooga Bike Plan

## Chattanooga Bike Plan, 2018 (continually updated)

This continually-updated bike-plan implementation program includes the following bike facility types and the current (2018) installed length of the various facility types:

- **Greenways:** mostly along currently-developed shared-use greenway routes
- **Protected bike lanes:** separated from vehicles by a striped/physical barrier) , mostly in selected, high-traffic downtown core areas
- **Bike lanes:** striped lane between vehicles and a curb or shoulder, found along other high-traffic collectors or arterial routes
- **Bike routes:** signed and / or striped indicator of bike presence, more commonly, found even in residential environments

The following bicycle facilities are proposed in Chattanooga (no plans currently exist for Red Bank) are:

- 1.) Proposed **bike lanes** along Manufacturers Road, Compress Street and Hamm Road
- 2.) Proposed **bike route designations** on Harper Street, Stringer Street, Houser Street and Powercorp Drive
- 3.) Proposed **bike route designations** on Manning Street, Whitehall Road and Riverside Avenue (where yield roadway designations are currently proposed as part of a NSG)
- 4.) Proposed **bike lanes** along Pineville Road and Signal Mountain Road to Port land Park with proposed bike lanes also along Mountain Creek Road
- 5.) Proposed **bike route designations** along West Elmwood Drive and East Elm wood Drive (where yield roadway designations are currently proposed as part of a NSG) to East Frontage Road at Dayton Boulevard (entering Red Bank limits at that point)
- 6.) Numerous proposed **bike route designations** in Hill City, North Chattanooga and to Lupton Drive and Thrushwood Drive via Haywood Avenue and Van Buren Street
- 7.) Proposed connections between the proposed Lupton Drive **bike route** and proposed bike lanes along Hixson Pike, the proposed Mercer Street and Azalean Drive **bike routes**, and the proposed North Access Road bike lanes. The proposed North Chickamauga Creek Greenway and trailhead and north from there to the proposed Cassandra Smith Road bike lanes, and the proposed Hixson Pike bike lanes.

The team will evaluate what proposed routes may be suitable for incorporation for the purpose of this study.

*Note: see the Existing and Proposed Bicycle and Pedestrian Infrastructure on pages 14 and 15 for maps that include proposed sidewalks, bike routes, lanes, and greenways.*

# The Mountain Creek Master Plan

## The Mountain Creek Community Greenway Master Plan (2003)

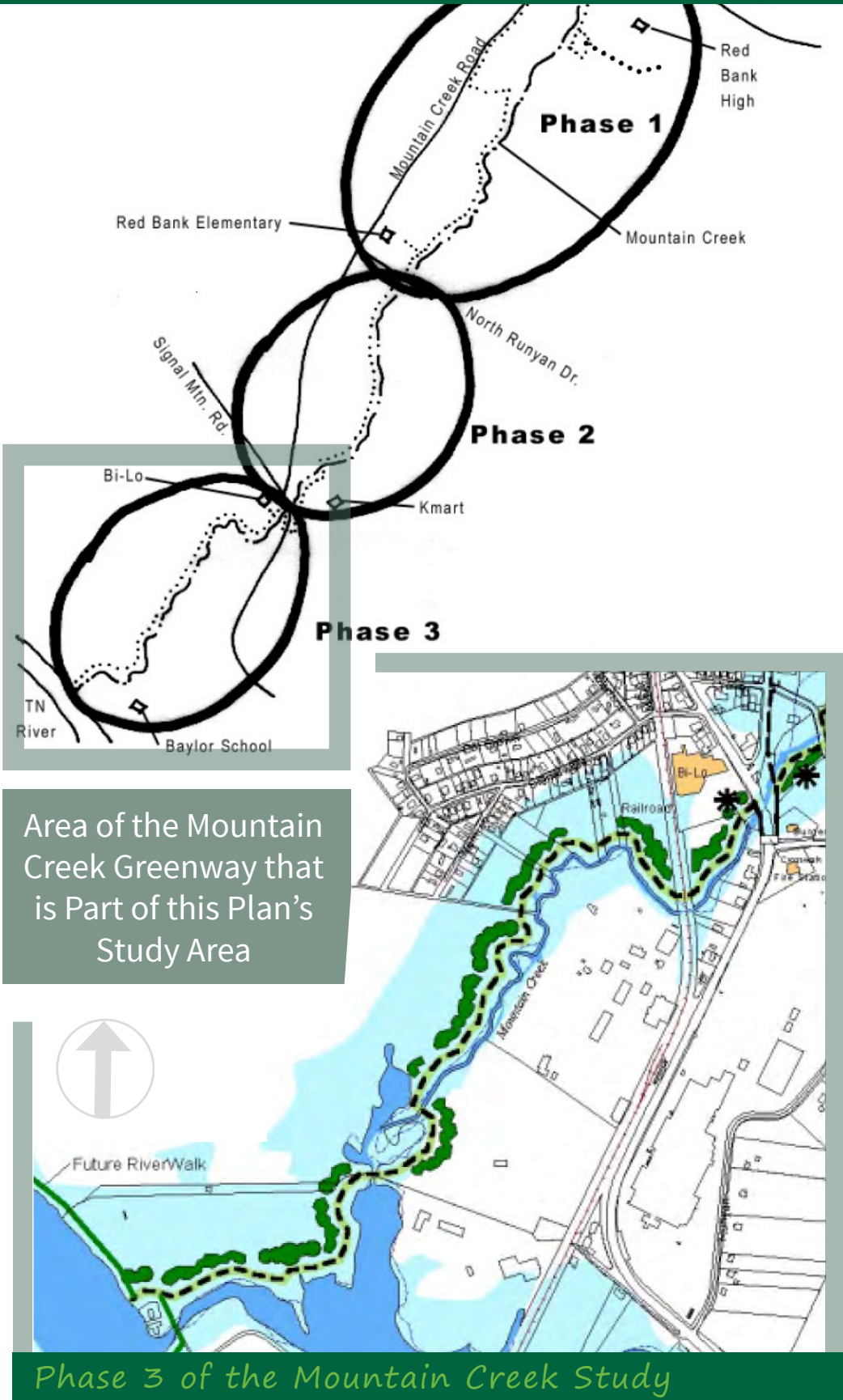
This plan, authored by the Chattanooga-Hamilton County Regional Planning Agency, looked at a greenway opportunity along the Mountain Creek Corridor, which is part of the study area of this plan. The study looks at a three-mile corridor.

The plan recommends that the section this study is looking at would be implemented in Phase 3. Further planning of the Mountain Creek Greenway has not progressed. This planning process can provide further detail on the alignment that is suggested as part of the Mountain Creek plan.

## CB Robinson Bridge Multi-Use Path Study

## North Chickamauga Creek Greenway Connector (2018)

The City of Chattanooga oversaw a study to connect the existing Tennessee Riverwalk on the south side of the Tennessee River to North Chickamauga Creek Greenway east of the bridge. This connection is important to this plan, as it would likely tie any greenway proposed in this plan to the south side of the river. The study looked at the best way to readapt the CB Robinson Bridge to allow for pedestrian/bicycle use and to ramp down on both sides of the river.





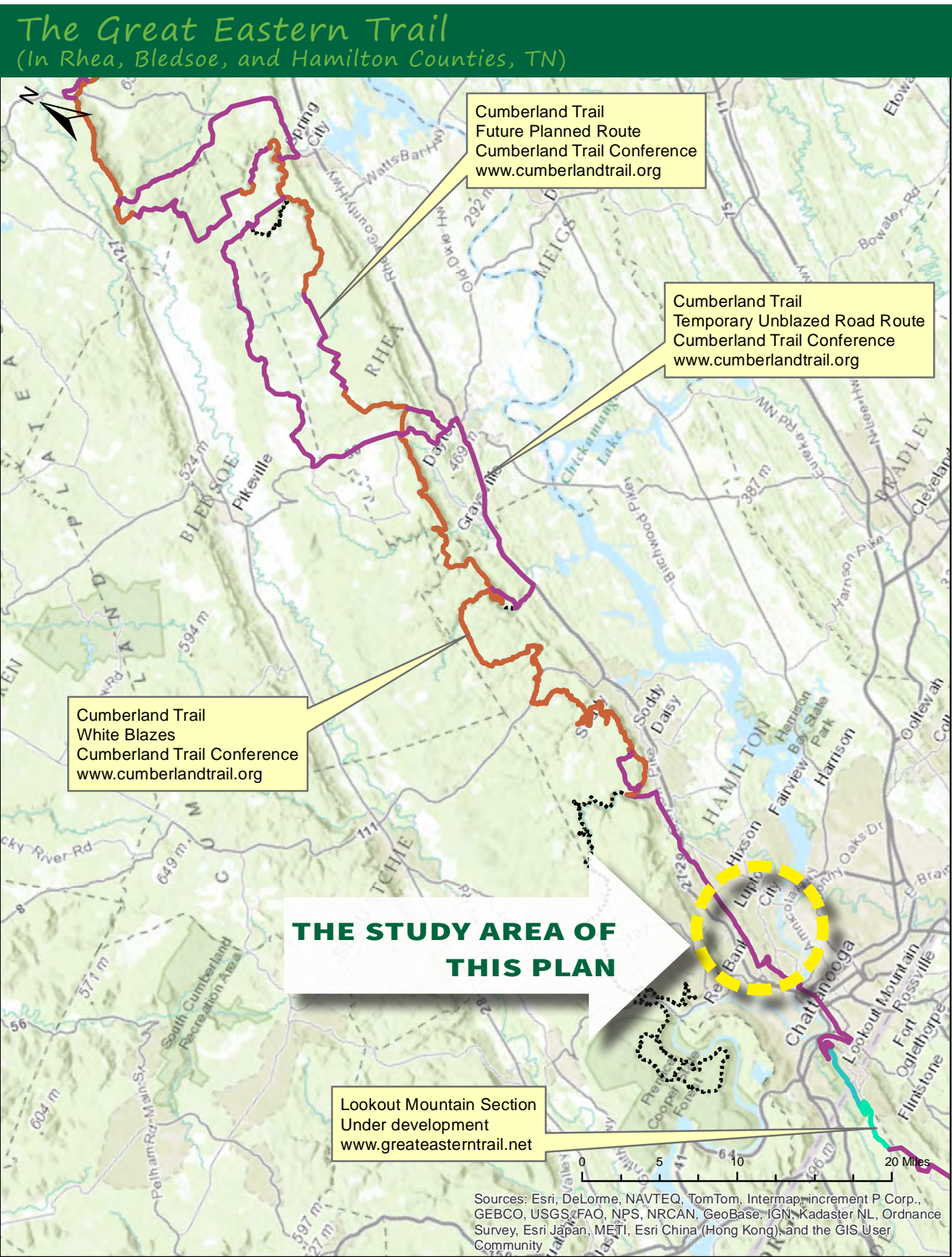
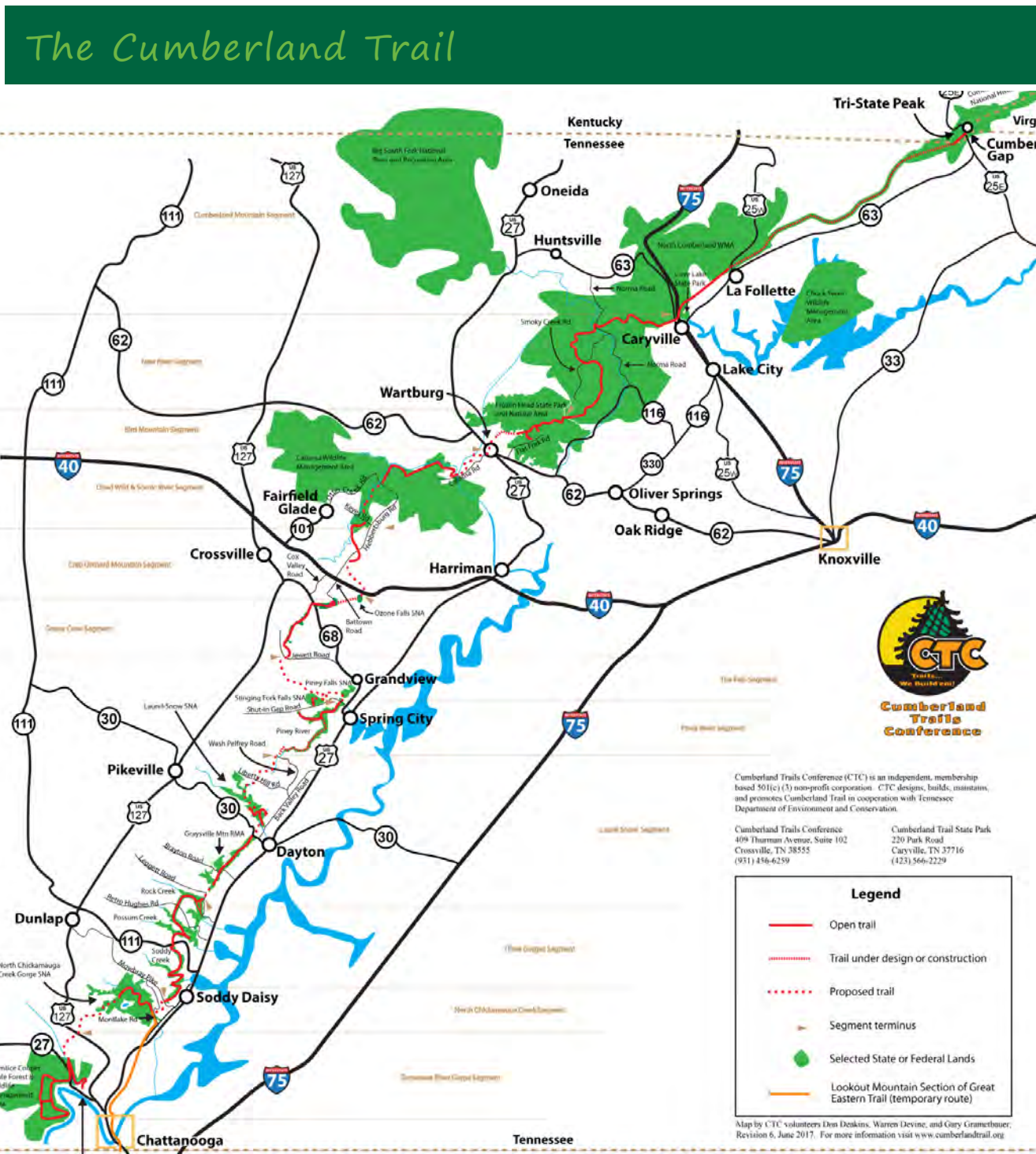
# The Great Eastern Trail/ The Cumberland Trail

## The Great Eastern Trail

The Great Eastern Trail is a current effort to connect the Florida National Scenic Trail, which is largely built, through Alabama and Georgia, connecting into Chattanooga, traveling north into Kentucky, West Virginia, Maryland, Pennsylvania, and New York. This effort is led by the national non-profit American Hiking Society, with a goal to connect existing trails to build a 1,800-mile long natural surface trail.

## The Cumberland Trail

The Cumberland Trail is a long distance natural surface trail planned to connect 300-miles of Eastern Tennessee running along the Cumberland Plateau and the Cumberland Valley. Over 237-miles of trail are open for hiking and many partners are actively working to connect more miles of trail. The trail has been designated as part of the Tennessee Recreation Trail System and designated as a State Scenic Trail. The effort is led by the Cumberland Trail Conference with major support from the Tennessee Department of Environment and Conservation. The Cumberland Trail proposes to connect to Signal Mountain but acknowledges the great Eastern Trail route which currently is a road-route that travels along Dayton Boulevard.







CHAPTER

2



## Types of Proposed Bicycle & Pedestrian Connectivity



# The Greenway (Paved with Asphalt or Permeable/Rubberized Pavement)



## Greenways Paralleling Roads



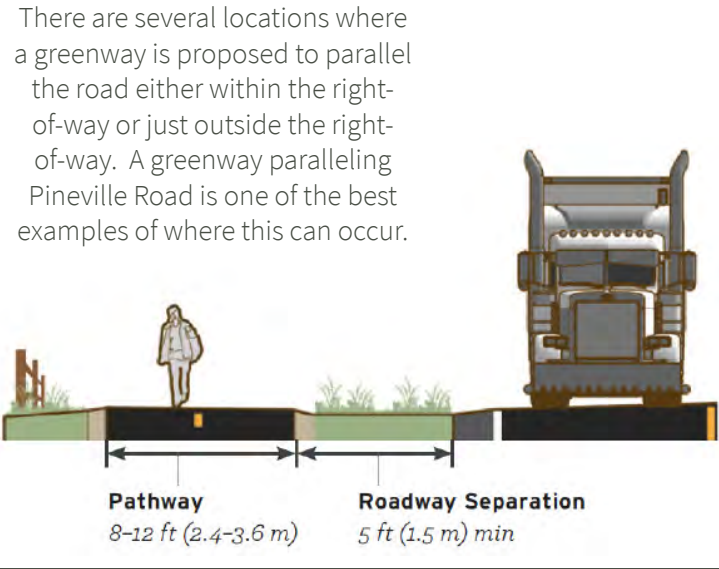
### Why a Greenway?

- **Greenways are more accessible for all types of users**, including bicyclists, pedestrians, people of all ages, and all abilities. Greenways tend to attract the widest varieties of users, making it a great return on investment.
- **Greenways have multiple benefits** as transportation corridors, linear parks, natural habitat protection areas, and connectors of neighborhoods previously unconnected.
- **Greenways provide multiple health and wellness benefits** by supporting active lifestyles and encouraging opportunities for social interaction.

### What Does It Look Like?

The greenway standard is typically a 10-12-foot paved asphalt trail. In one section of Stringers Ridge Park, a rubberized permeable paved surface is recommended. Greenways can also be classified as:

**Shared use paths**-another name typically given when traveling along a transportation corridor or in the context of transportation. They can also be called **side-paths** if directly adjacent to roads.



### Variations Upon the Greenway

Steeper sections of the greenway

Boardwalk greenway

Image courtesy of the Trust for Public Lands  
A river-side greenway

#### Steep Slopes

In areas where steep slopes (in pink above) are indicated, greenway construction costs will be higher and may require retaining walls and switchbacks to maintain an accessible grade.

#### Wetlands

One of the most scenic places of the project area is behind the Walmart on Signal Mountain Road. Crossing Mountain Creek would likely require a boardwalk system. While boardwalks can significantly elevate cost, they can provide access to a previously inaccessible area owned by the City of Chattanooga that could become a nature park.

#### Along the River

The best opportunity to have a shoreline greenway along the Tennessee River is in the eastern part of the project area from Rivermont Park to North River Soccer Fields. Crossing under CB Robinson Bridge (pictured above) is feasible and would provide a continuous river-side greenway for nearly a mile and a half.



# The Cherokee Boulevard Two-Way Cycle Track



Image courtesy of People for Bikes

## Why a Cycle Track Along Cherokee Blvd.?

The City of Chattanooga's original recommendation prior to the greenway being proposed was a buffered bike lane. For the following reasons, it is suggested the proposed design be changed to a two-way cycle track:

**Safety:** Upon studying traffic volumes on Cherokee Blvd. near the tunnel, it was determined it was not safe for users to cross the boulevard to get to the western bike lane. A

cycle track is proposed to allow greenway users to travel the cycle track and then safely cross at a signalized intersection at Manning St.

**Comfort for Even the Most Inexperienced Bicyclist:** This cycle will enable an ease of use for the most experienced road commuter to a family of cyclist anting to access Renaissance Park.

**A More Human-Scaled Streetscape:** Th reduction of lanes and complete/sidewalk and bicycle facilities can aid in continued revitalization of this corridor.

Driveways and minor street crossing are a unique challenge to cycle track design. Here are a few practices to make intersections with driveways and streets the safest:

- If the cycle track is parking protected, parking should be prohibited near the intersection to improve visibility. The desirable no-parking area is 30 feet from each side of the crossing.
- For motor vehicles attempting to cross the cycle track, sidewalk furnishing, signage, and other features should accommodate a sight triangle of 20 feet to the cycle track from minor crossing and 10 feet from a driveway.
- Color yield lines, and "Yield to Bikes" signage should be used to identify the conflict areas and make it clear that the cycle track has priority over entering and exiting traffic.
- Motor vehicles crossing the cycle track should be constrained or channelized to make turns at sharp angles to reduce travel speed prior to crossing.

*NOTE: Several locations along Cherokee Boulevard have parking that backs right onto the road. It will be necessary to work with these landowners to safely redesign parking that is safer for bicyclists and pedestrians. Redevelopment should design for on-street parking or parking behind buildings.*

- 7 A raised median, bus bulb or curb extension may be configured in the cycle track buffer area to accommodate transit stops. Cyclists should yield to pedestrians crossing the roadway/cycle track at these points to reach the bus stop.

Image courtesy of [www.pedbikeimages.org/](http://www.pedbikeimages.org/)  
Adam Cppoppola Photography



## Buffered Bike Lane Design Details

### Design Guidance for a Two-Way Cycle Track

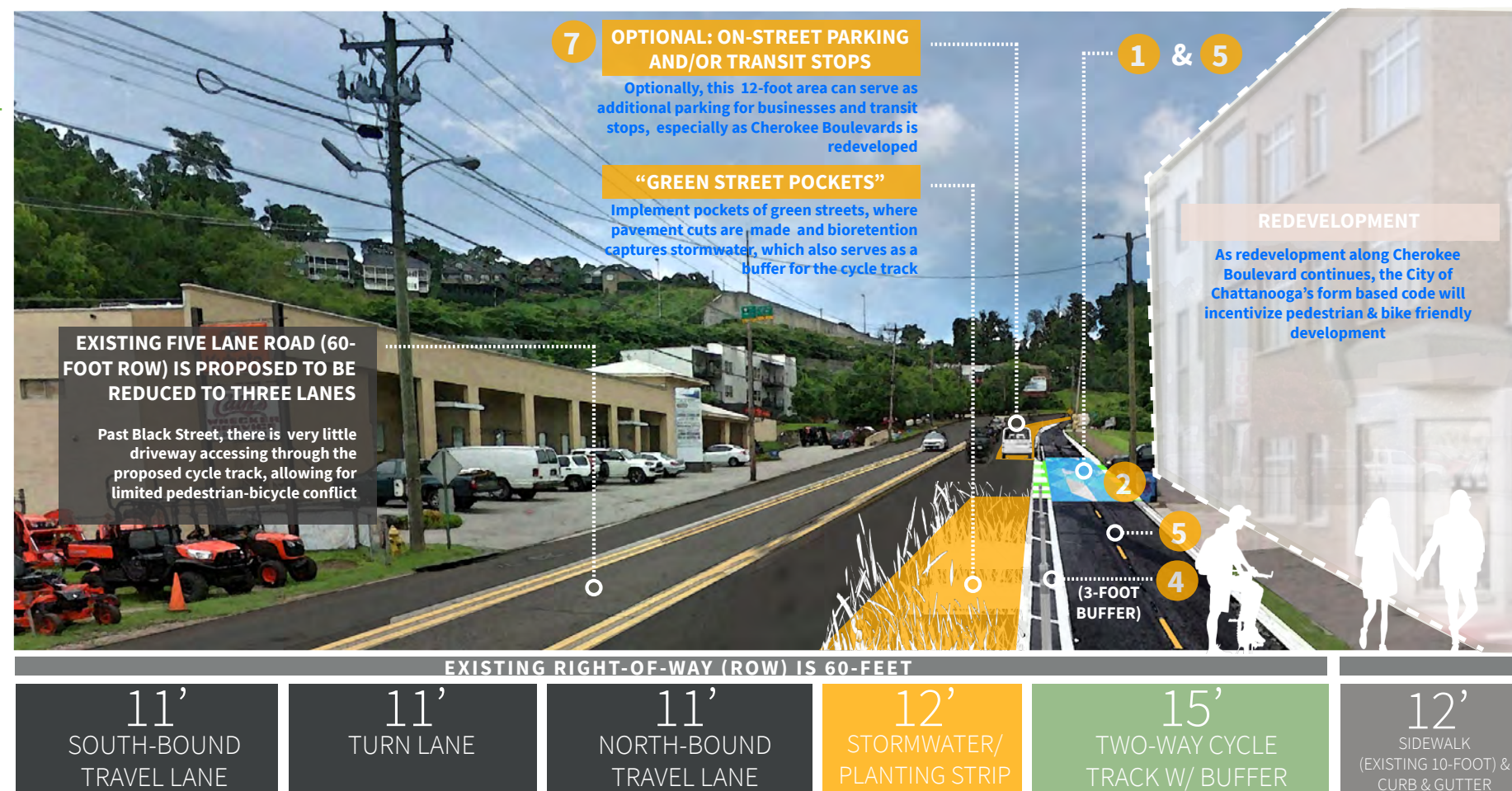
Language Per the Urban Bikeway Design Guide:

#### REQUIRED FEATURES

- 1 Bicycle lane word, symbol, and/or arrow markings (MUTCD Figure 9C-3) shall be placed at the beginning of a cycle track and at periodic intervals along the facility to define the bike lane direction and designate the portion of the street for preferential use by bicyclists.
- 2 A "DO NOT ENTER" sign (MUTCD R5-1) with "EXCEPT BIKES" plaque shall be posted along the facility to only permit use by bicycles.
- 3 Intersection traffic controls along the street (e.g. stop signs and traffic signals) shall also be installed and oriented toward bicyclists traveling in the contra-flow direction. This is applicable at the Manning Street intersection.

#### RECOMMENDED FEATURES

- 4 When protected by a parking lane, 3 feet is desired width for a parking buffer to allow for passenger loading and to prevent door collisions.
- 5 A dashed yellow centerline should be used to separate two-way bicycle traffic and to help distinguish the cycle track from any adjacent pedestrian area.





# The Dayton Boulevard “Main Street/”Right-sizing”

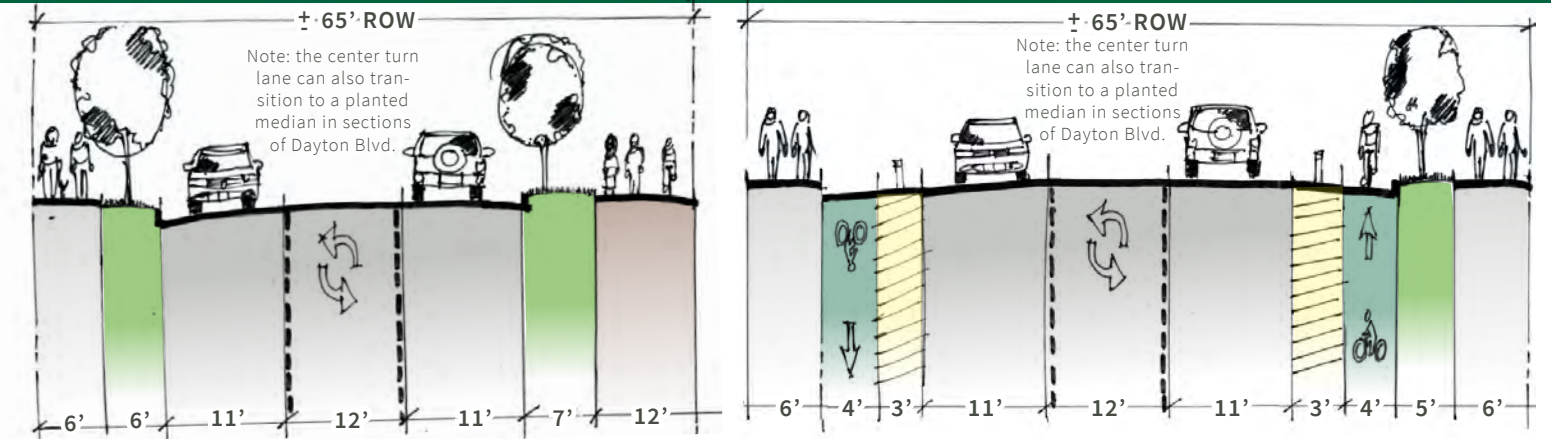


- ### Why Road “Right-sizing”?
- **Dayton Boulevard is designed to carry (level of service) more cars than it actually does.** The corridor in some areas may be over-designed for its current average daily traffic. Reducing lanes may still meet the needed level of service—further investigation should establish if lanes could be reduced. Current Annual Average Daily Traffic (AADT) show Dayton Blvd. to range from 10,000-18,000. See page 16 for a further detail of AADT and vehicle and bicycle/pedestrian conflicts in the area.
  - **Dayton Boulevard has higher vehicle and bicycle/pedestrian conflicts.** According to regional transportation data (see Pedestrian/bike Crash Data Map on page 14), Dayton Boulevard is one of the more dangerous roads in the North Shore and Red Bank area, with multiple bicycle/pedestrian collisions occurring along the corridor in recent history.
  - **The commercial redevelopment along Dayton Boulevard could create a sense of place as the “Main Street” of the City of Red Bank.** “Right-sizing” or the reduction of lanes could provide an improved pedestrian bicycle experience, which has been proven to stimulate commercial redevelopment.

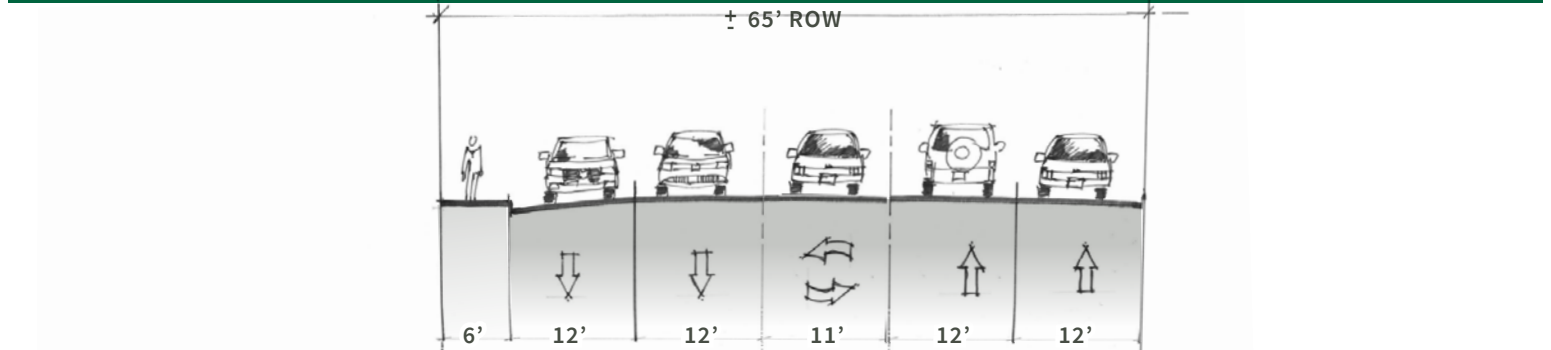


Example: Dalton, Georgia “Right-sizing”

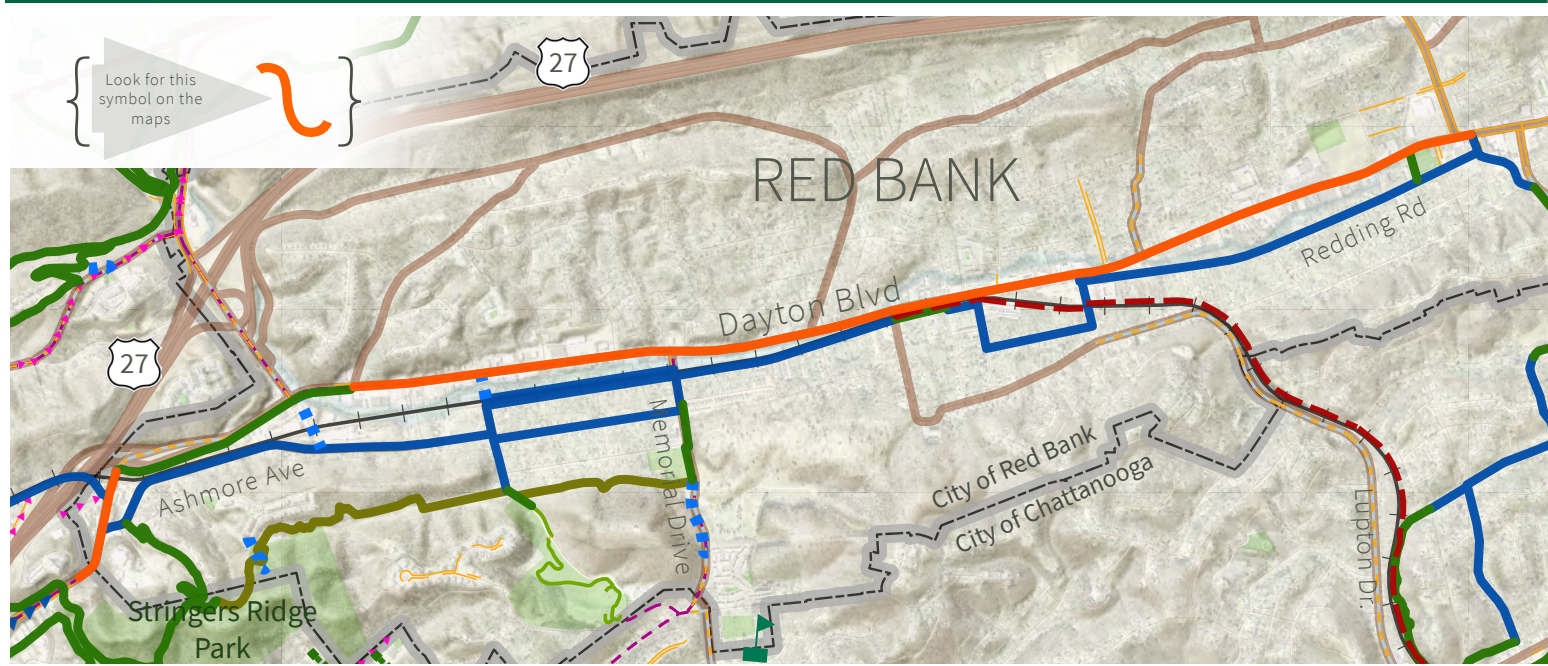
## The Multi-use Path Option Vs. The Bike Lane/Sidewalk Option



## Vs. Existing Conditions on Dayton Blvd.



A comparison with other local roads





# Rail-with-Trail

{ See Appendix A for a detailed record of conversation with NSRR about potential use of ROW }



Image shows the Norfolk Southern rail line as travels along Lupton Drive, while ROW is 100-feet wide, the side slopes within the ROW are steep



A typical condition of the rail line along Dayton Boulevard



An opportunity exists for rail-with-trail (if ROW was purchased) in front of Walmart off of Signal Mountain Road

## Can Railroad Right-of-Way Become a Greenway Corridor?

Initial conversations with Norfolk Southern Rail Road (NSRR) indicate that use of their rail right-of-way (ROW) will be challenging (See correspondence in Appendix A). However, several scenarios exist where use of ROW may have potential:

**Feasibility of Rail-with-Trail.** Identified within this plan are segments of the rail ROW that are critical for the larger network connectivity, or that have wider ROW that allows the greatest likelihood of a rail-with-trail. That being said, as NSRR's policy is not to consider rail-trail in their ROW, this may require political maneuvering. If a less restrictive rail operative were to manage the ROW, some general design considerations that apply are:

- Distance separation is a key design factor.** Required distance offset from the track averages at 33-feet, but can be smaller or larger depending on rail type and speed. The rail company typically sets this distance. The majority of NSRR ROW width is 100-feet (50-feet both sides of track)
- Separation by grade, fencing, and vegetation** are all highly encouraged, or in some cases required for increased safety.

**Lease or sale of ROW.** All communication from NSRR indicate the line is profitable and sale is unlikely. However, the line serves only a handful of manufactures, who at some future time may no longer need this service, making lease or sale more likely. Opportunities to use the ROW may include:

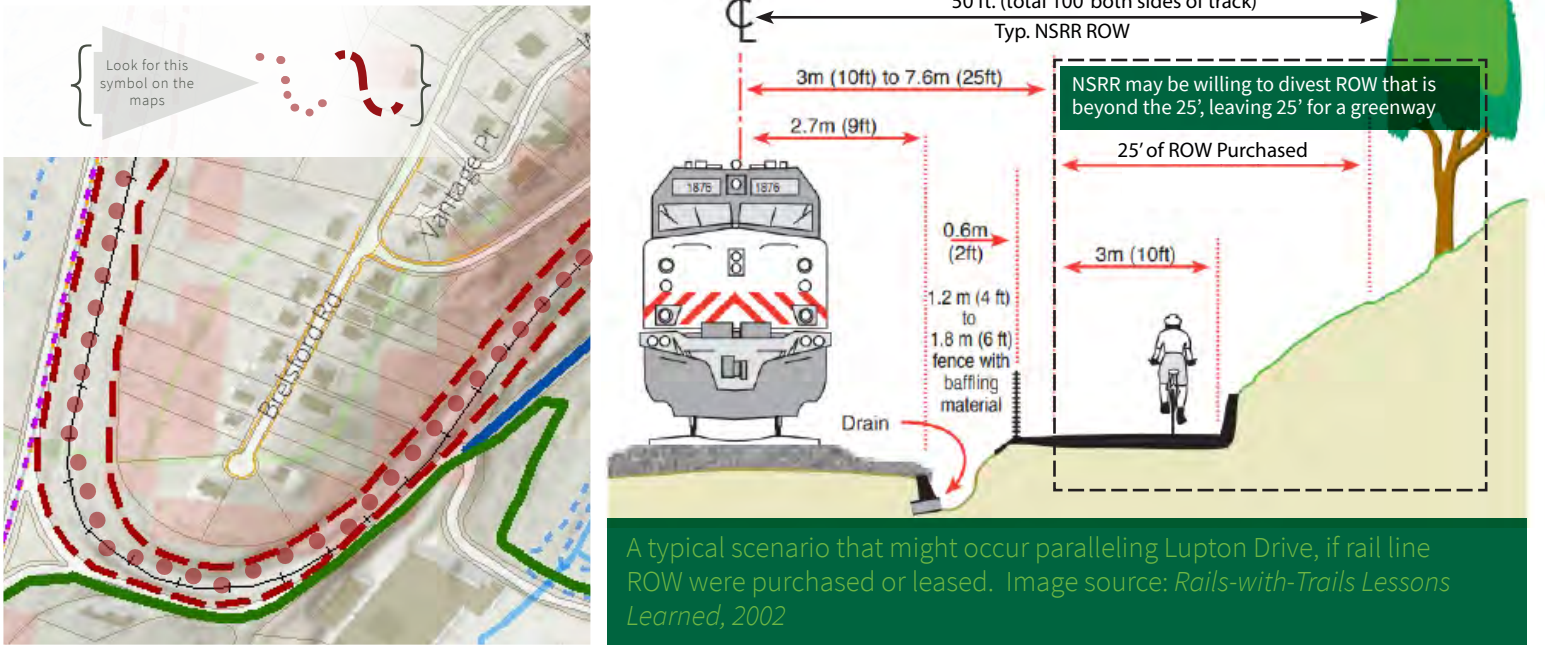
- Transfer of local rail-line ownership:** Local rail companies who may lease or purchase typically are more flexible in policy and regulations related to greenways.
- Purchase of ROW to convert it to a rail-trail greenway:** Purchase of the entire ROW is possible if it is deemed unprofitable in the future. NSRR has indicated this is currently an unlikely scenario.
- Purchase of a portion of the ROW:** NSRR has indicated it may be willing to sell ROW in excess of 50'. They have indicated they would expect to sell at full market value after an in-depth analysis of impacts to the rail line. They would also expect the provision for increased security measures (fencing, etc.). The ROW averages 100' through the corridor making this the most feasible present-day scenario.

**Crossings of NSRR ROW.** NSRR allows for crossing on existing at-grade crossings of the line. They allow new crossings over or under the rail, but with design requirements that can often make the crossing cost-prohibitive.



Image courtesy of Michael Hicks

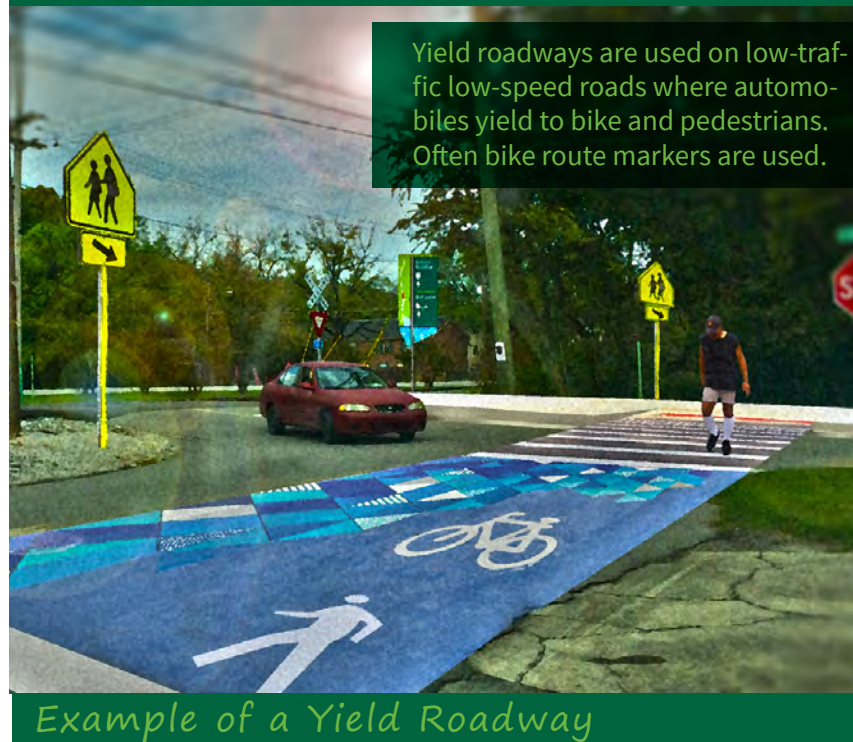
Image courtesy of Dan Burden



A typical scenario that might occur paralleling Lupton Drive, if rail line ROW were purchased or leased. Image source: *Rails-with-Trails Lessons Learned*, 2002



# The Bike/Walk Boulevard



Yield roadways are used on low-traffic low-speed roads where automobiles yield to bike and pedestrians. Often bike route markers are used.

Example of a Yield Roadway

## Why a Bike/Walk Boulevard?

- **Bicycle Boulevards** are a concept that adapt low traffic volume roads, making them more bicycle and pedestrian friendly. Through traffic calming design, route markings, and signage, the road is prioritized for pedestrians and bicyclists first, and vehicles second. These elements can be phased in on segments of the route over time and can come after the early designation as a yield-roadway.
- A low-cost Yield Roadway can be developed as a first phase, with transition to a bike boulevard in the future. Minimal investment in route markers can be made now to indicate this is a safe biking route, but in the future the addition of sidewalks and traffic calming can enhance safety, a sense of place, and usability.

## West & East Elmwood Drive & West & East Lydon Avenue

Two of the best locations for bike boulevards are options in Chattanooga and Red Bank. These scenarios represent some of the best opportunities for a bike boulevard with sidewalk.

## Guidelines for a Bike Boulevard

- Have no greater than a 2,000/day average traffic daily count.
- Preferably have a design speed less than 20/mph but no more than 30 mph.
- Phase in sidewalks for increased pedestrian comfort.
- Use shared lane markings, crosswalks, and other traffic calming opportunities that make the street designed for bicycles and pedestrians, but accessible by cars.

## Optional Design for the Bike/Walk Boulevard

### The Yield Roadway First phase (shown above)

### with conversion to The Bike/Walk Boulevard Second phase (shown below)

Image source: Small Town and Rural Multimodal Network, FHWA, 2016

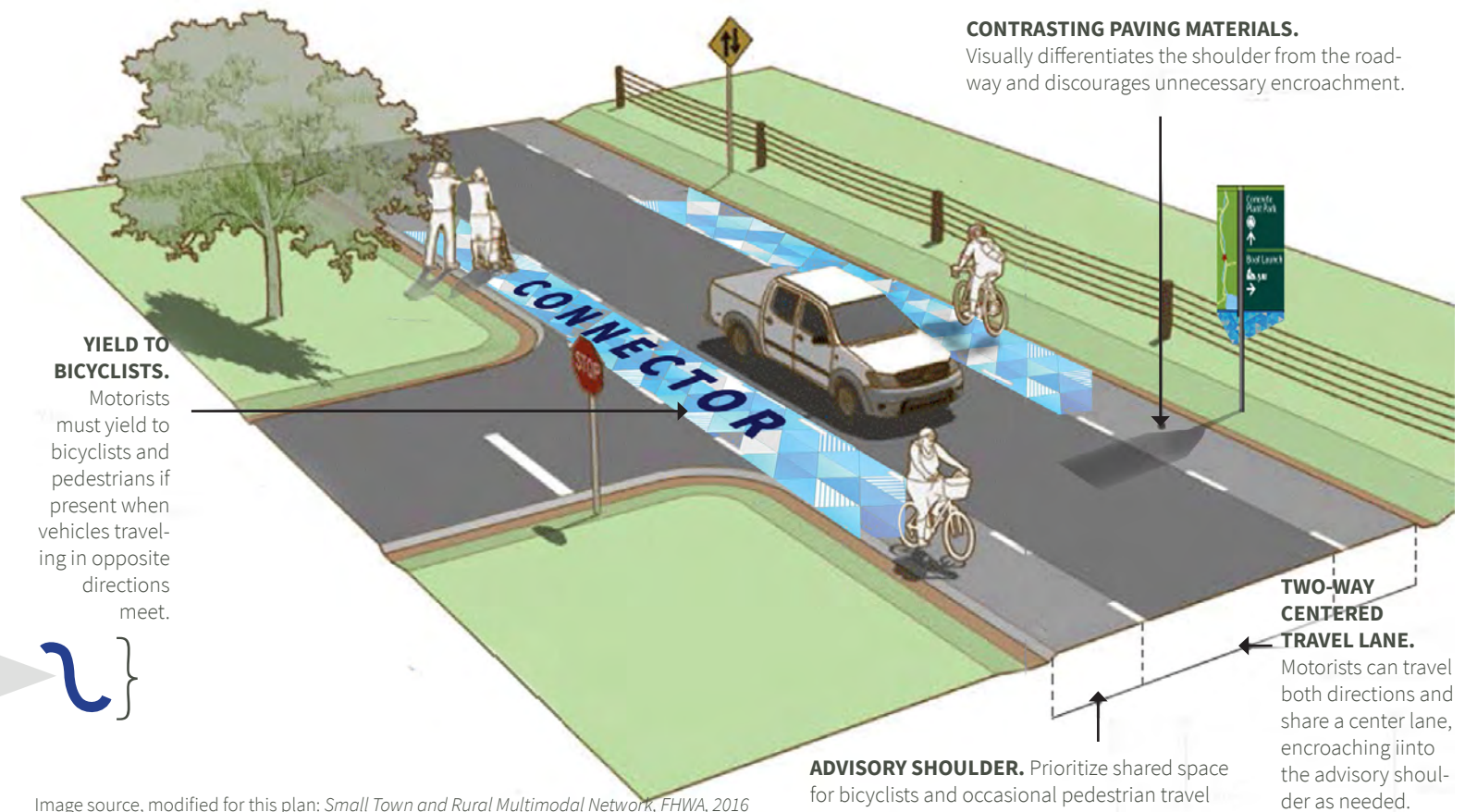
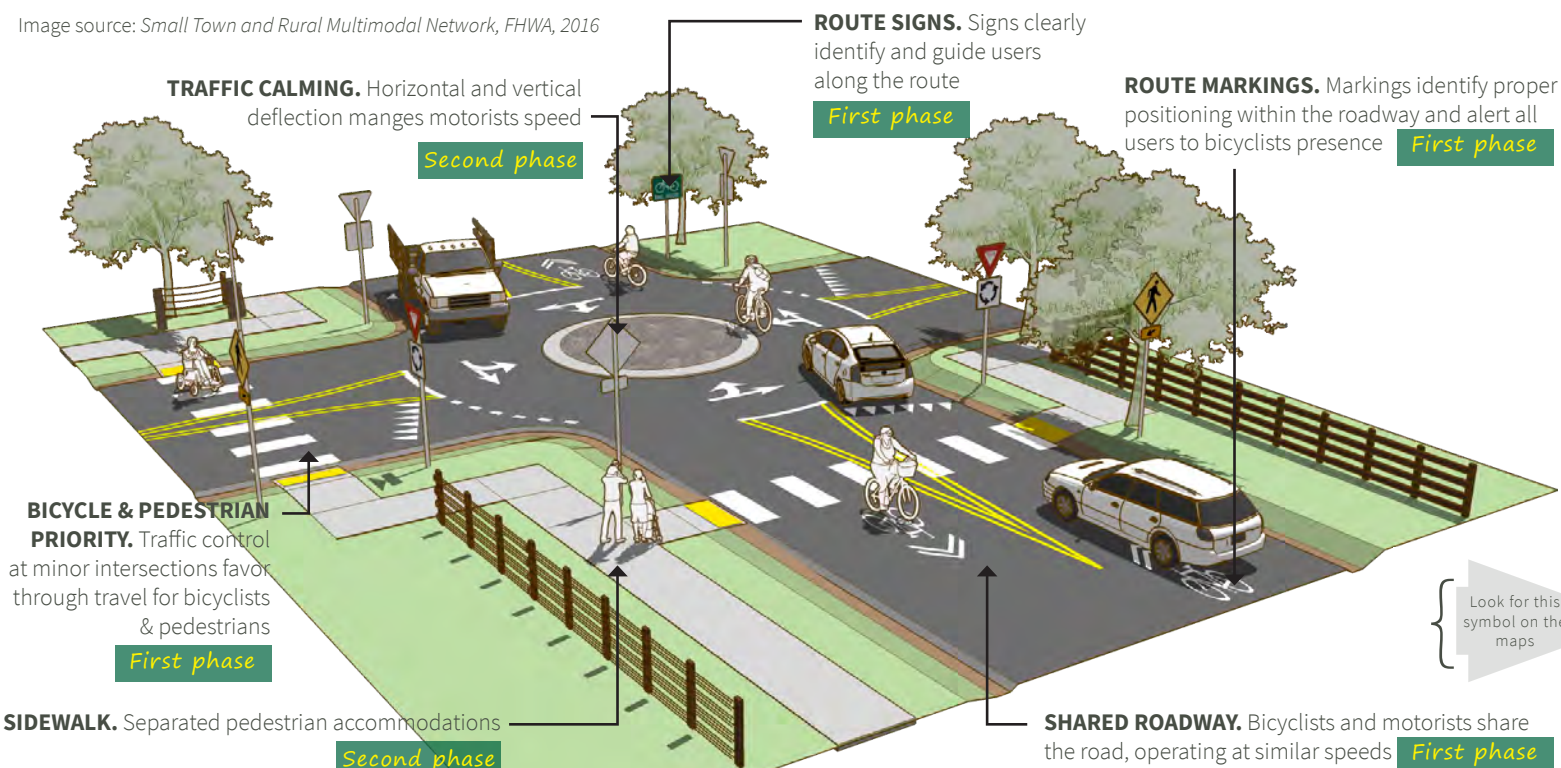


Image source, modified for this plan: Small Town and Rural Multimodal Network, FHWA, 2016





CHAPTER  
**3** Existing Conditions



- EXISTING PED./BIKE FACILITIES**
- Existing Sidewalk
  - Existing Bike Lane
  - Existing Bike Route
  - Buffered Bike Lane

Challenge Areas for pedestrian/bicycle connectivity

- BUILT & NATURAL ENVIRONMENT BASE LAYERS**
- Municipal Boundary
  - Floodway
  - NS Railroad Line
  - Roads
  - Parks/Open Space
  - Schools

Data source: Chattanooga-Hamilton County Regional Planning Agency, 2018

## HOW DOES EXISTING PEDESTRIAN/ BICYCLE RELATE TO THIS PLAN

Greenways can serve as “highways” for pedestrian/bicycle transportation, allowing both a high level of volume of users and wide variety of user types. It is important to plan ways for existing infrastructure to be served by or connected to routes proposed in this plan. It is also important to locate barriers and facility gaps for pedestrian and bicyclists. Some of these challenges and gaps are summarized on this map.

High volume traffic along Signal Mountain Road with interchanges, and multiple intersections make pedestrian/bicycle travel challenging

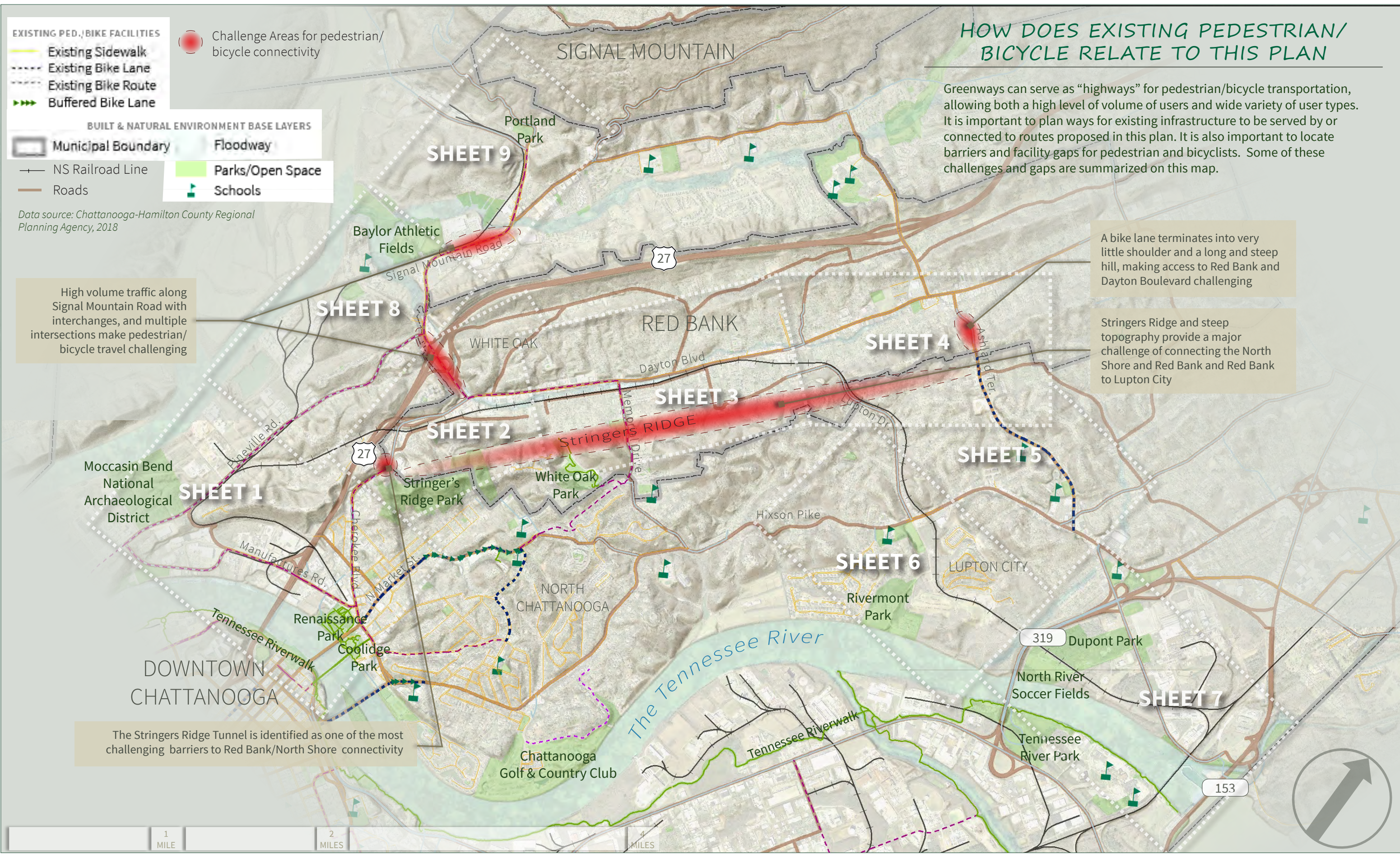
A bike lane terminates into very little shoulder and a long and steep hill, making access to Red Bank and Dayton Boulevard challenging

Stringers Ridge and steep topography provide a major challenge of connecting the North Shore and Red Bank and Red Bank to Lupton City

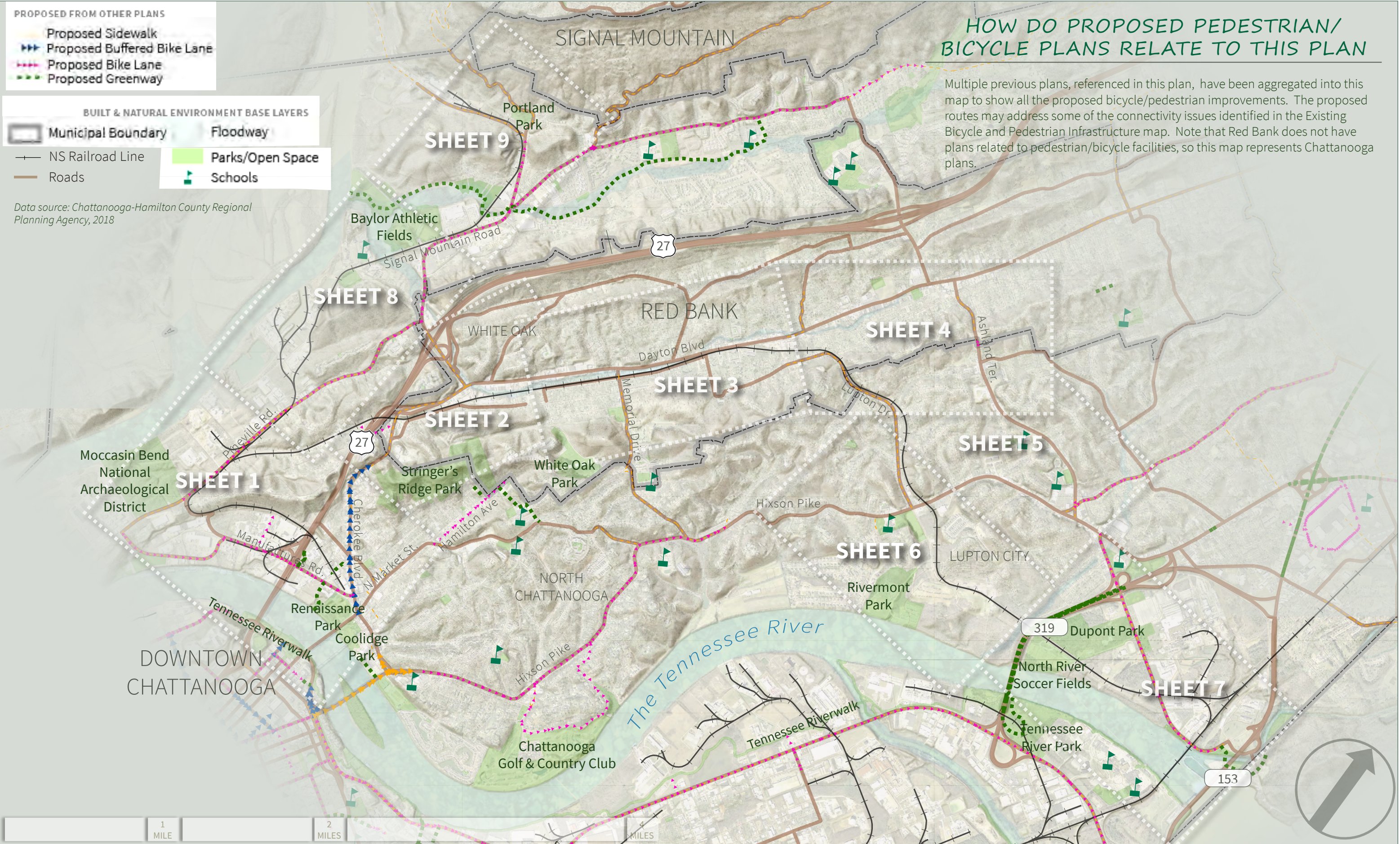
Moccasin Bend National Archaeological District

DOWNTOWN CHATTANOOGA

The Stringers Ridge Tunnel is identified as one of the most challenging barriers to Red Bank/North Shore connectivity









Density of employers      # of employees at employer



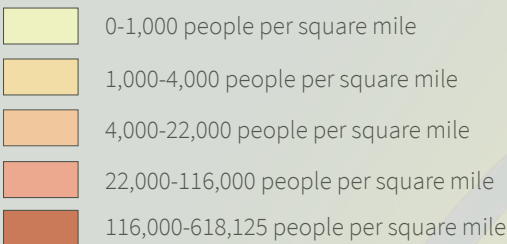
- Greenways can serve as transportation connectors to employment hubs. As shown, many larger employers exist in the North Shore and along Signal Mountain Road. Connecting to the employment density further east may be more difficult due to several roads with high traffic volume and little existing bicycle/pedestrian infrastructure.



## CONNECT TO EXISTING EMPLOYERS OPPORTUNITY



POPULATION DENSITY  
(PER SQUARE MILE)

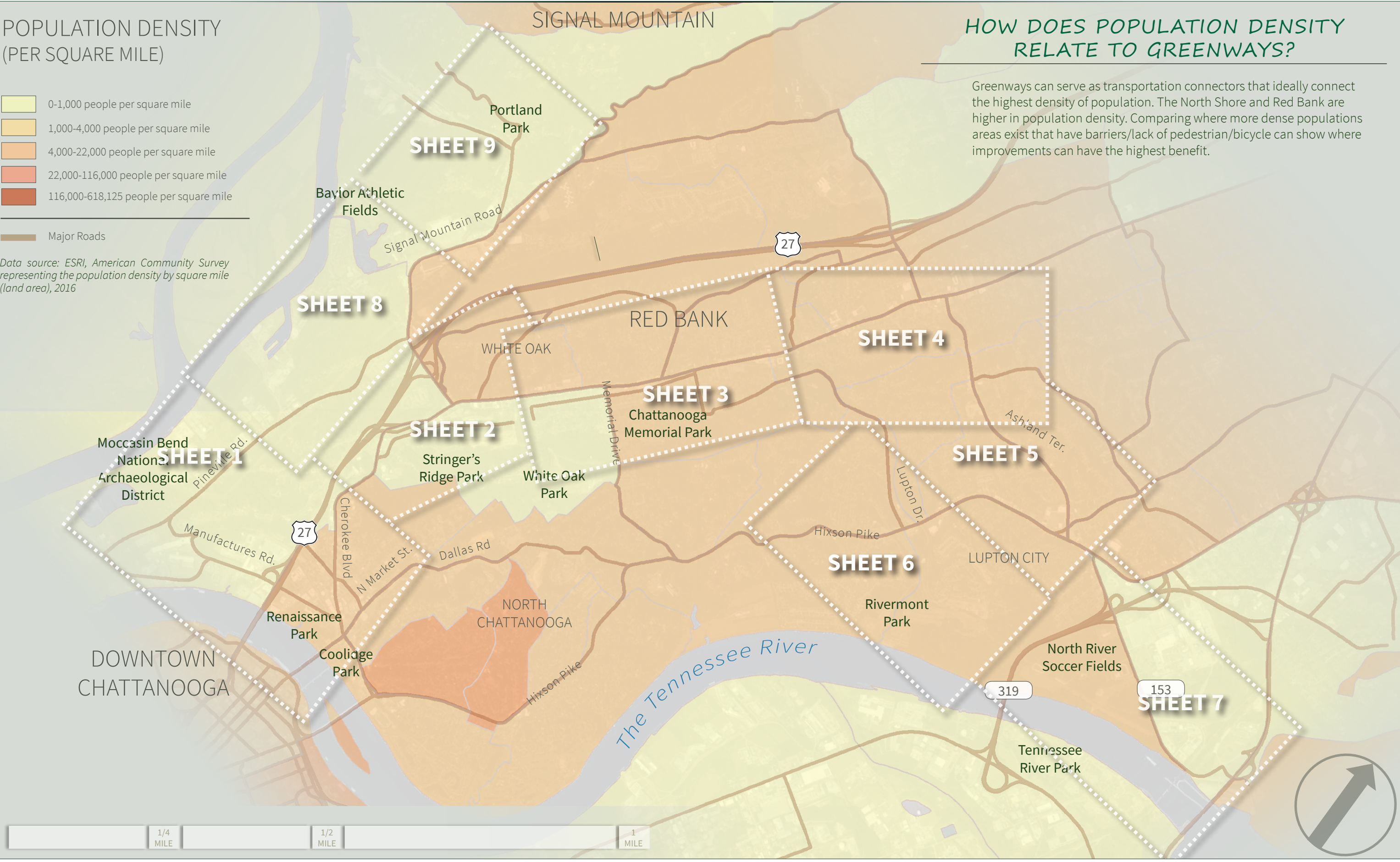


Major Roads

Data source: ESRI, American Community Survey representing the population density by square mile (land area), 2016

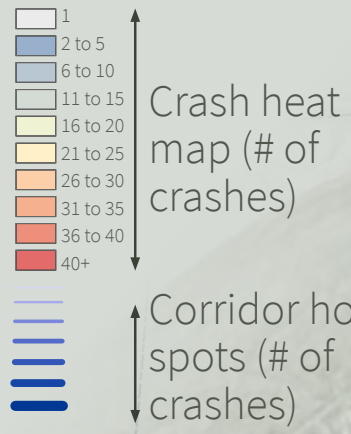
HOW DOES POPULATION DENSITY  
RELATE TO GREENWAYS?

Greenways can serve as transportation connectors that ideally connect the highest density of population. The North Shore and Red Bank are higher in population density. Comparing where more dense populations areas exist that have barriers/lack of pedestrian/bicycle can show where improvements can have the highest benefit.





# PEDESTRIAN/BIKE CRASH DATA



Data source: Pedestrian Bicycle Network Screening Cambridge Systematics developed for the 2045 Regional Transportation Plan, Chattanooga-Hamilton County / North Georgia Transportation Planning Organization (2017)

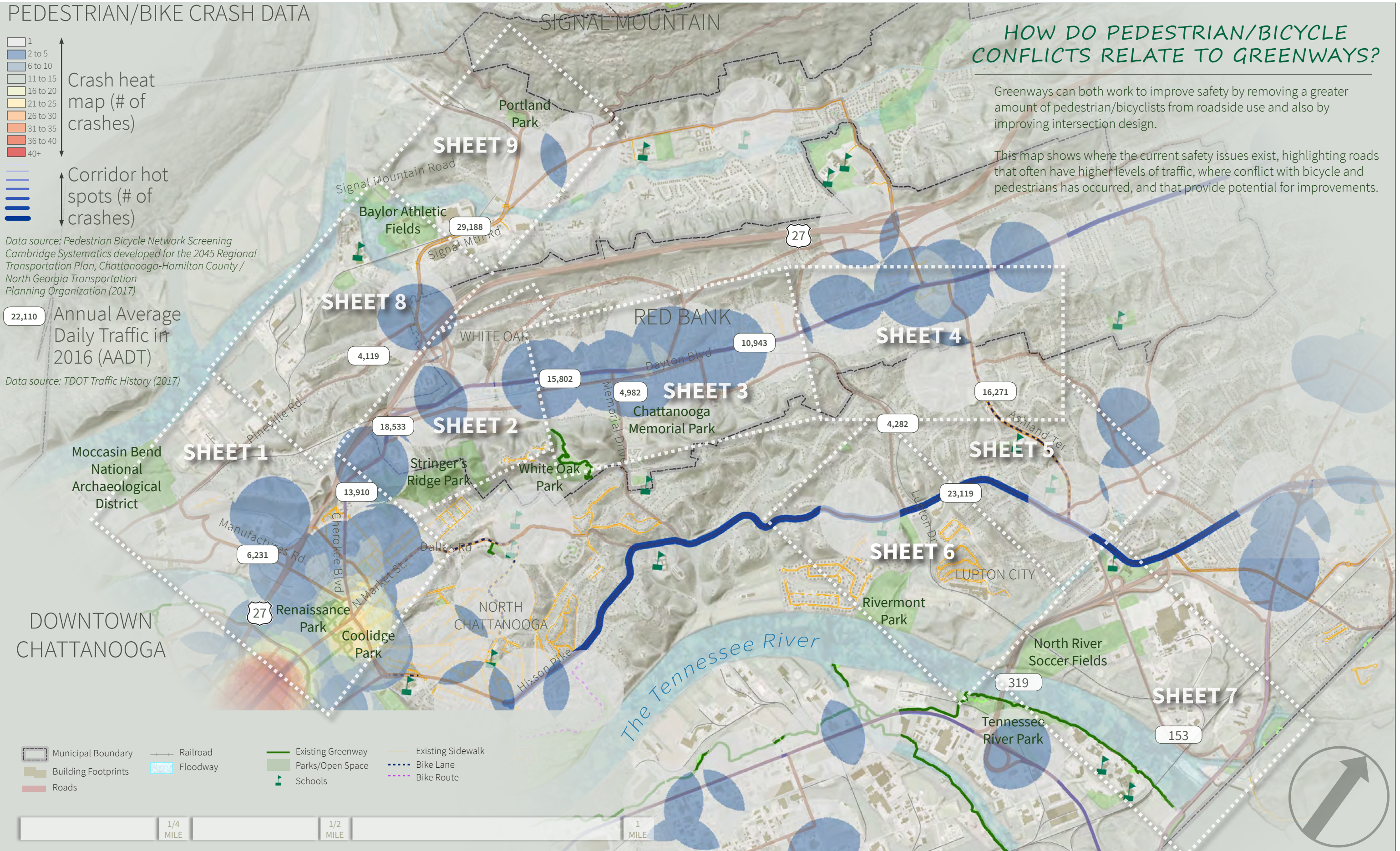
**22,110** Annual Average Daily Traffic in 2016 (AADT)

Data source: TDOT Traffic History (2017)

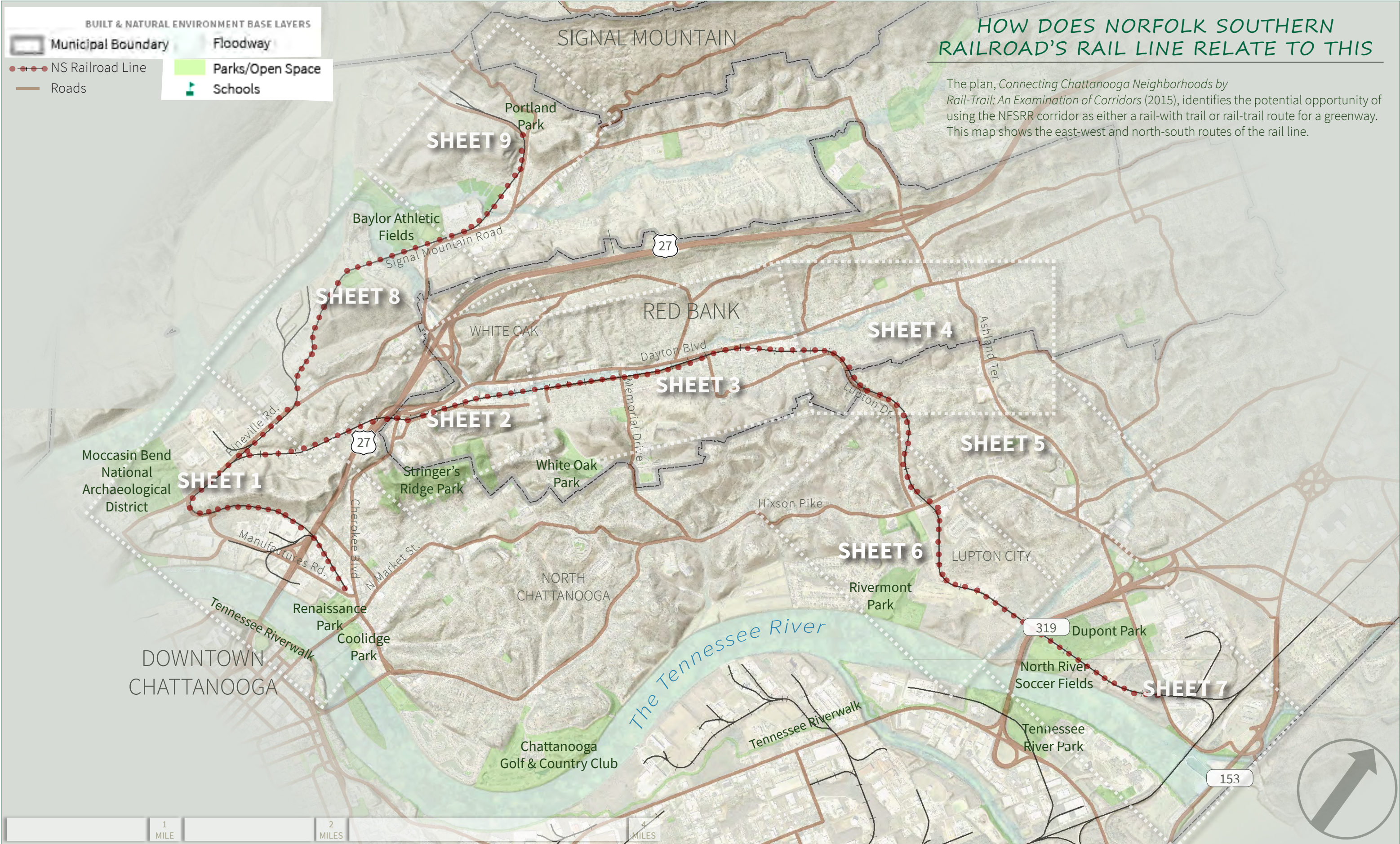
## HOW DO PEDESTRIAN/BICYCLE CONFLICTS RELATE TO GREENWAYS?

Greenways can both work to improve safety by removing a greater amount of pedestrian/bicyclists from roadside use and also by improving intersection design.

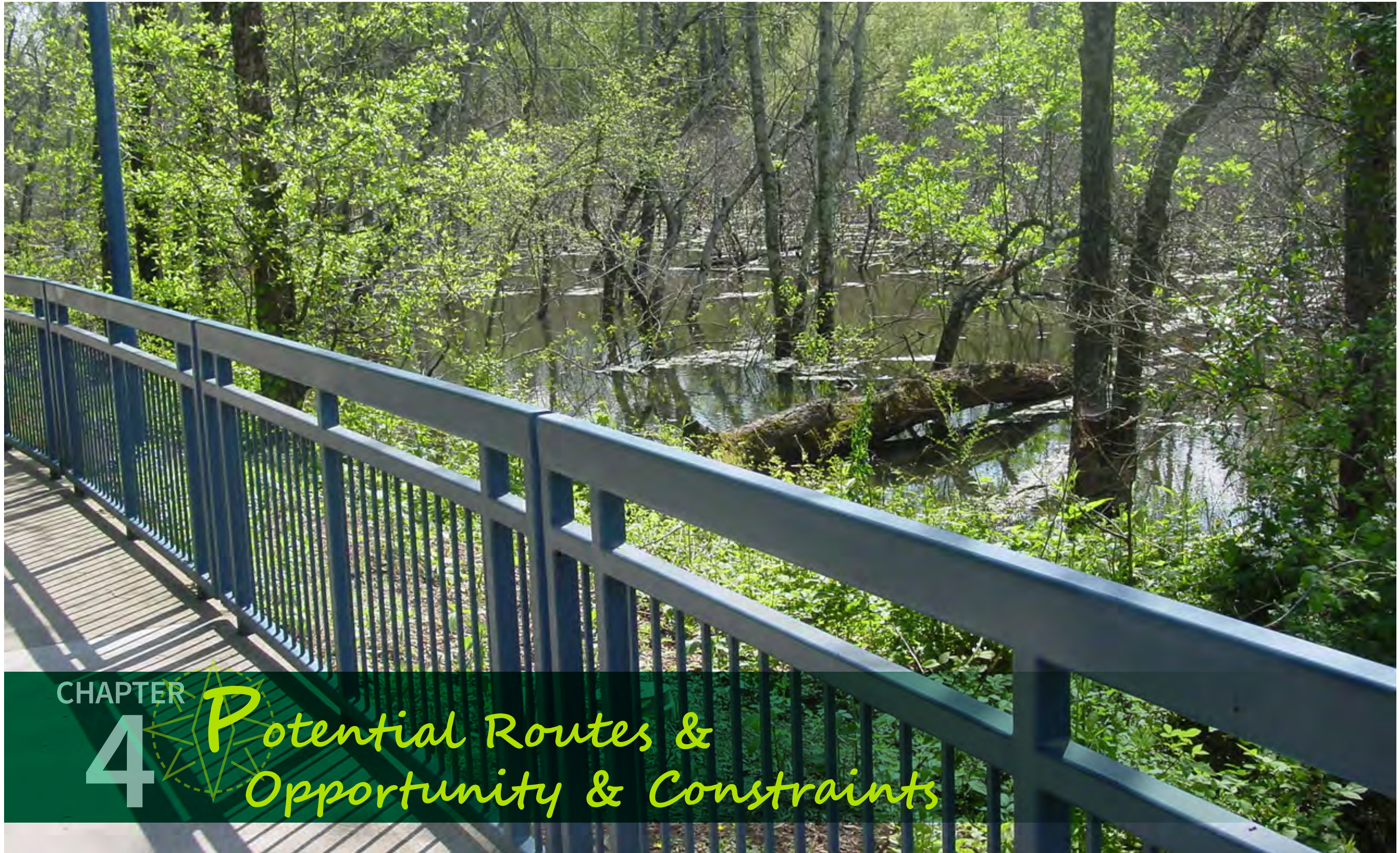
This map shows where the current safety issues exist, highlighting roads that often have higher levels of traffic, where conflict with bicycle and pedestrians has occurred, and that provide potential for improvements.











CHAPTER

4

# Potential Routes & Opportunity & Constraints



RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENT OPTIONS

**OPTIONS PROPOSED IN THIS PLAN**

- Greenway (10'-12' paved)
- Greenway (10' crushed stone)
- Bike Boulevard/Yield Roadway
- Dayton Boulevard Main Street/"Right-sizing"
- Buffered Bike Lane
- Rail-with-Trail
- Pedestrian/Bike Connection Needed
- Bike Route

Note: A rail-trail is possible if the Norfolk Southern Railroad ROW goes up for sale. This has not been displayed in these options.

**EXISTING PED./BIKE FACILITIES**

- Existing Sidewalk
- Existing Bike Lane
- Existing Bike Route
- Buffered Bike Lane

**PROPOSED FROM OTHER PLANS**

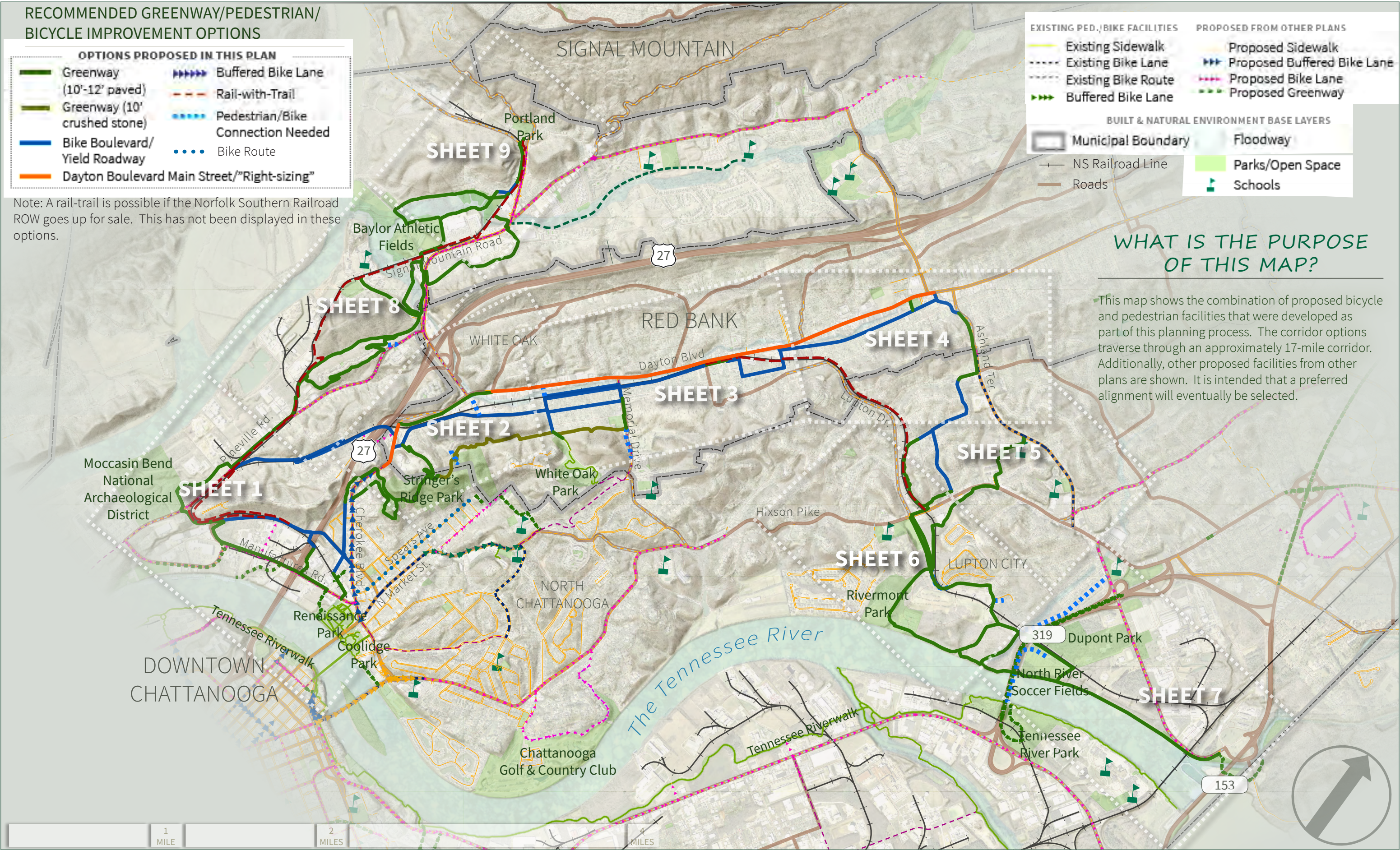
- Proposed Sidewalk
- Proposed Buffered Bike Lane
- Proposed Bike Lane
- Proposed Greenway

**BUILT & NATURAL ENVIRONMENT BASE LAYERS**

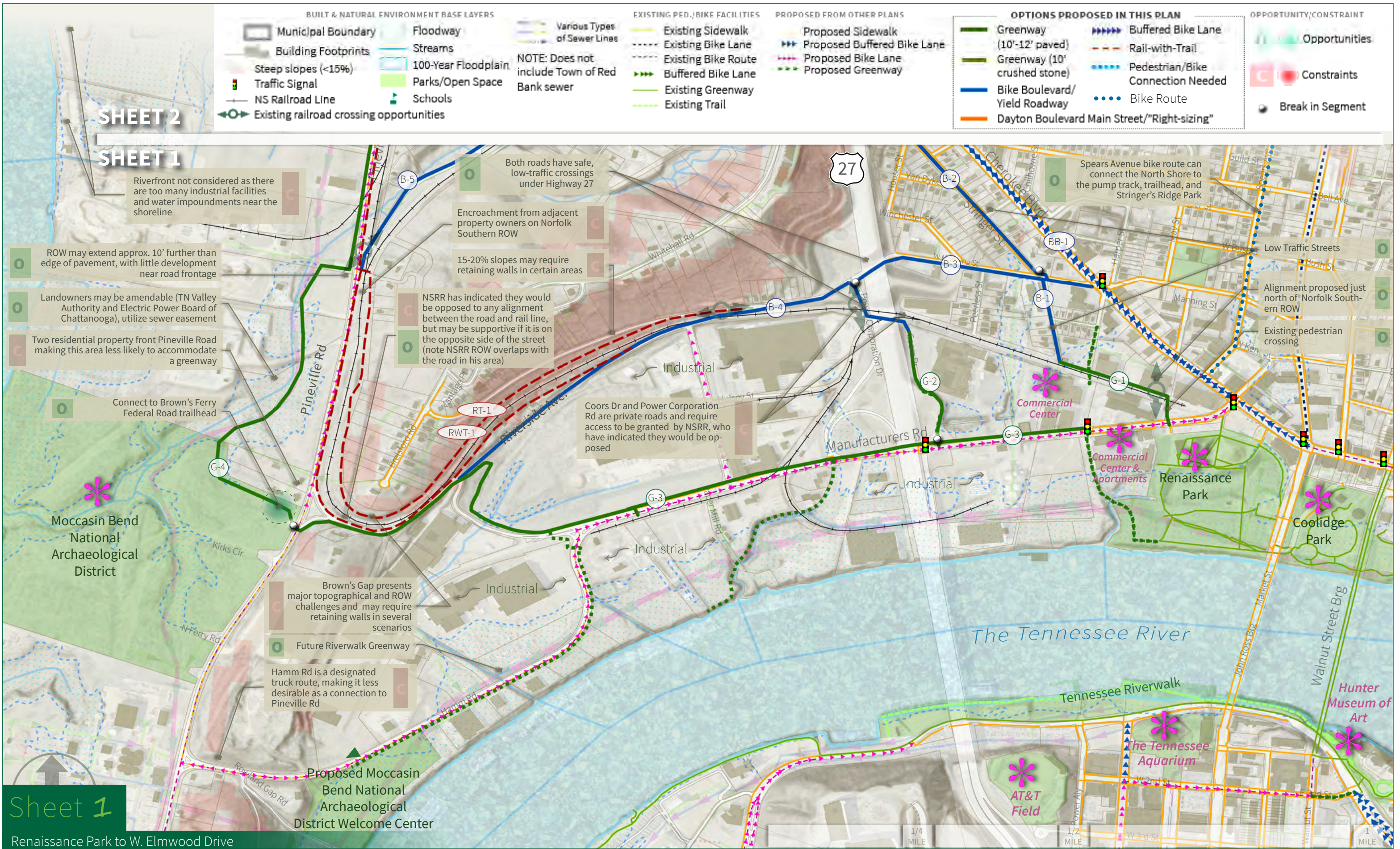
- Municipal Boundary
- NS Railroad Line
- Roads
- Floodway
- Parks/Open Space
- Schools

WHAT IS THE PURPOSE OF THIS MAP?

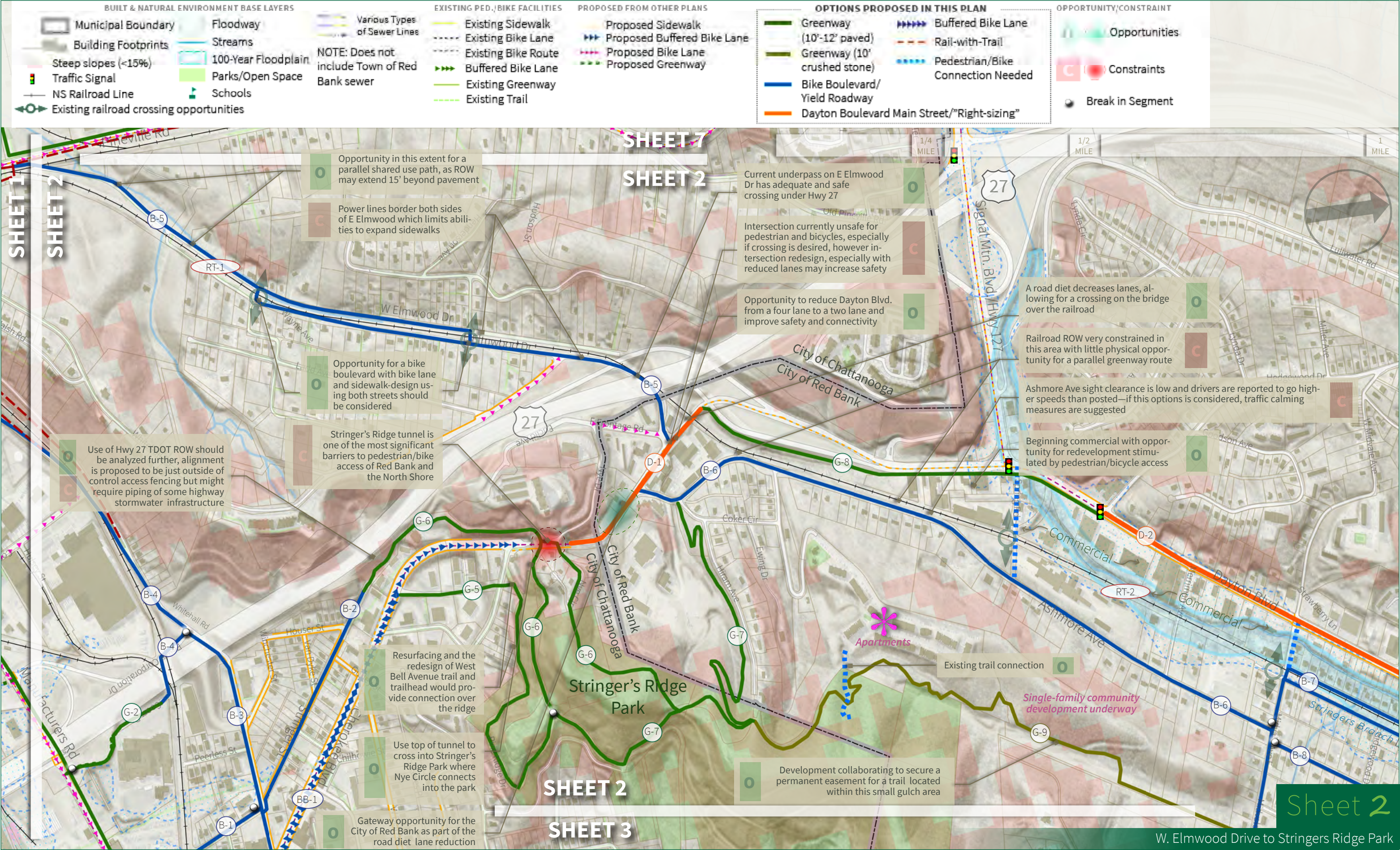
This map shows the combination of proposed bicycle and pedestrian facilities that were developed as part of this planning process. The corridor options traverse through an approximately 17-mile corridor. Additionally, other proposed facilities from other plans are shown. It is intended that a preferred alignment will eventually be selected.



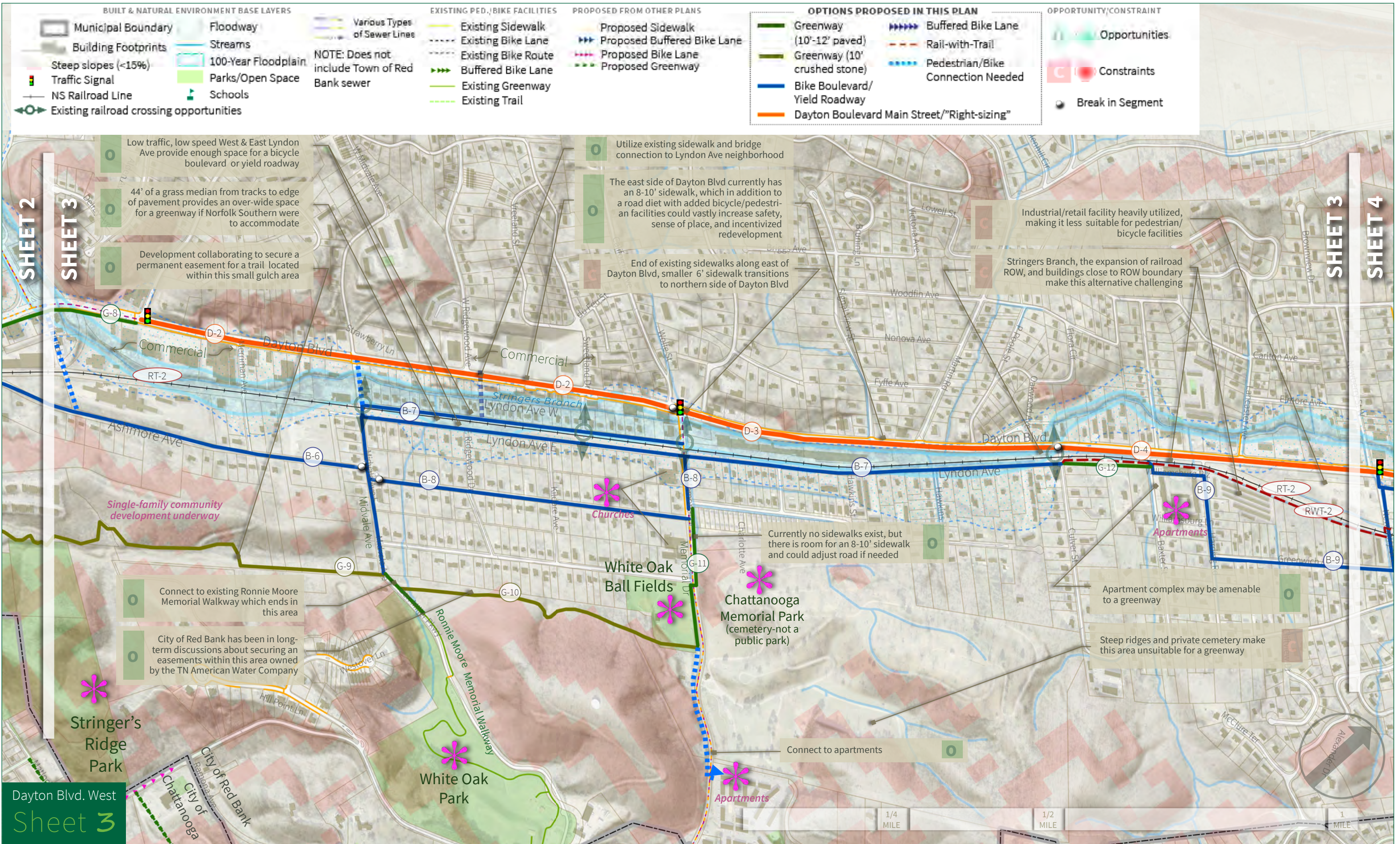






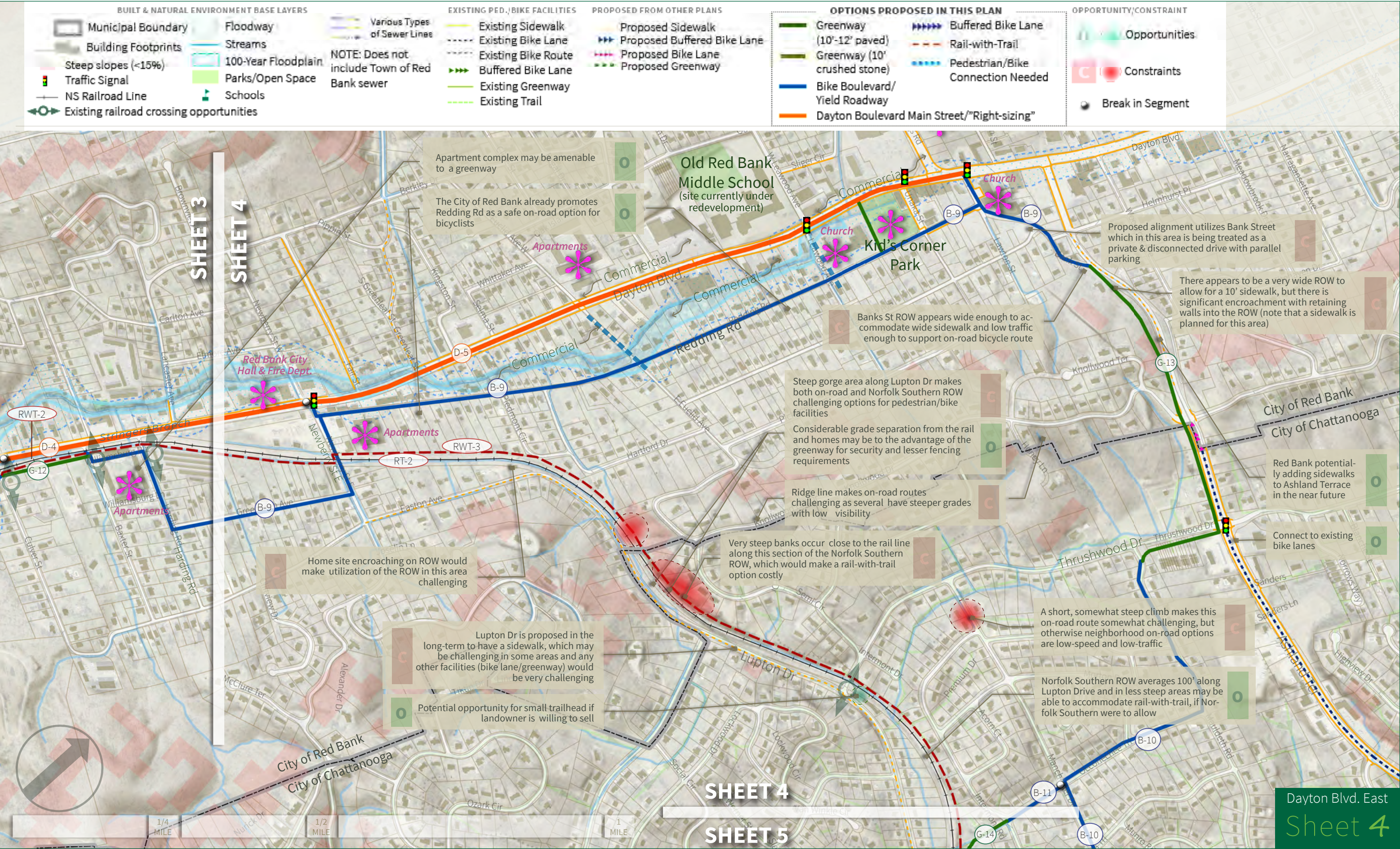






Dayton Blvd. West  
Sheet 3



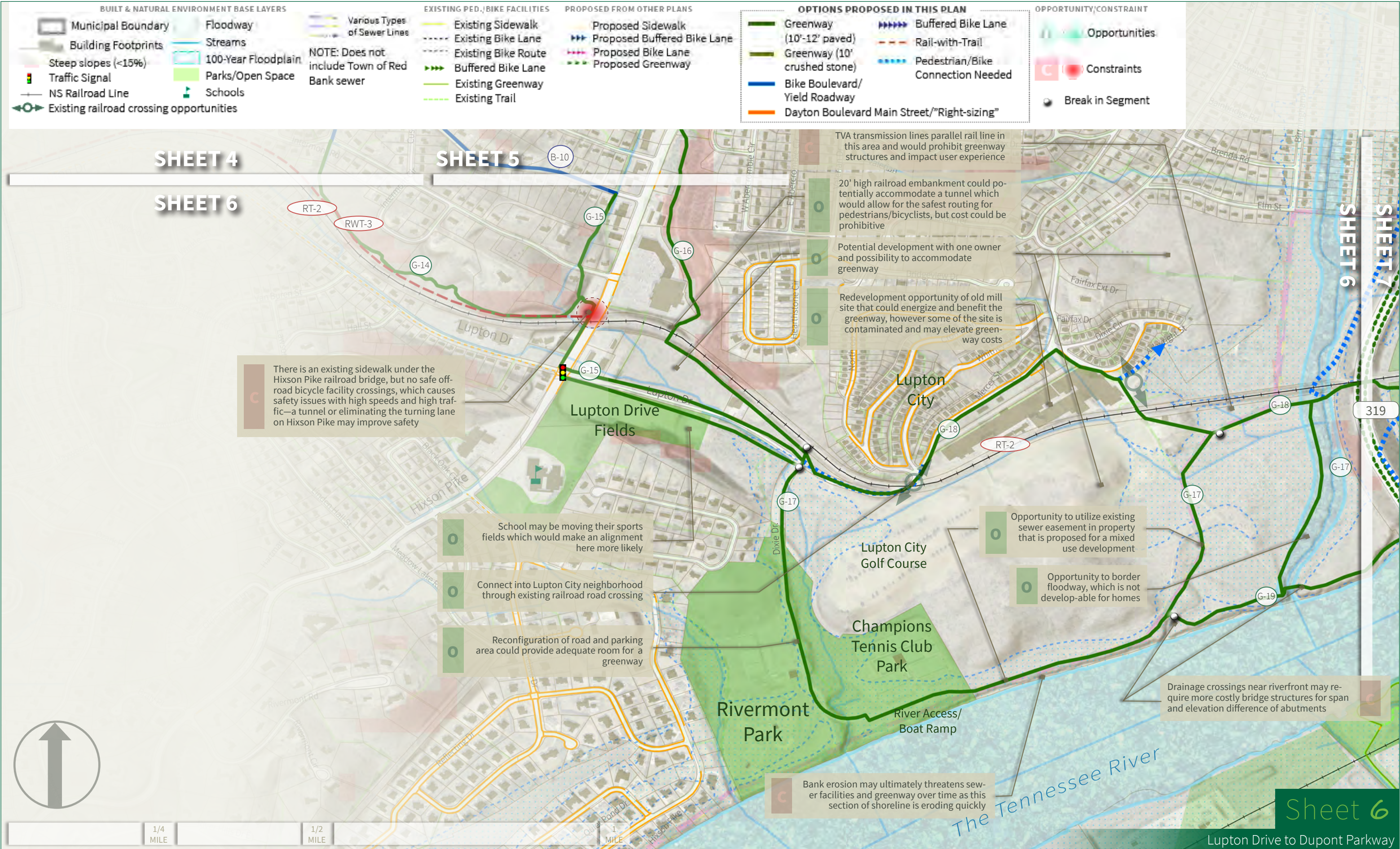


# OPPORTUNITIES & CONSTRAINTS

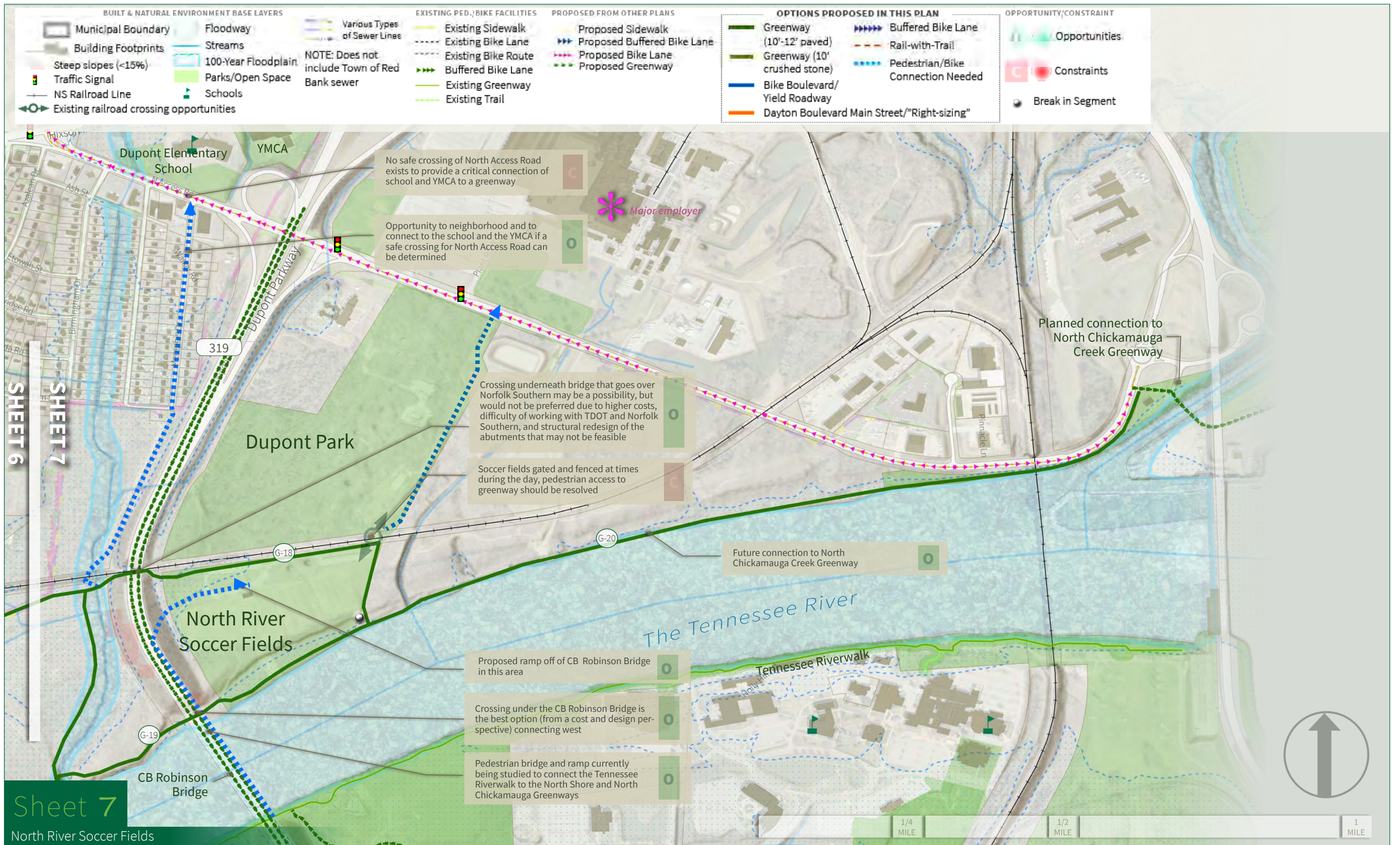










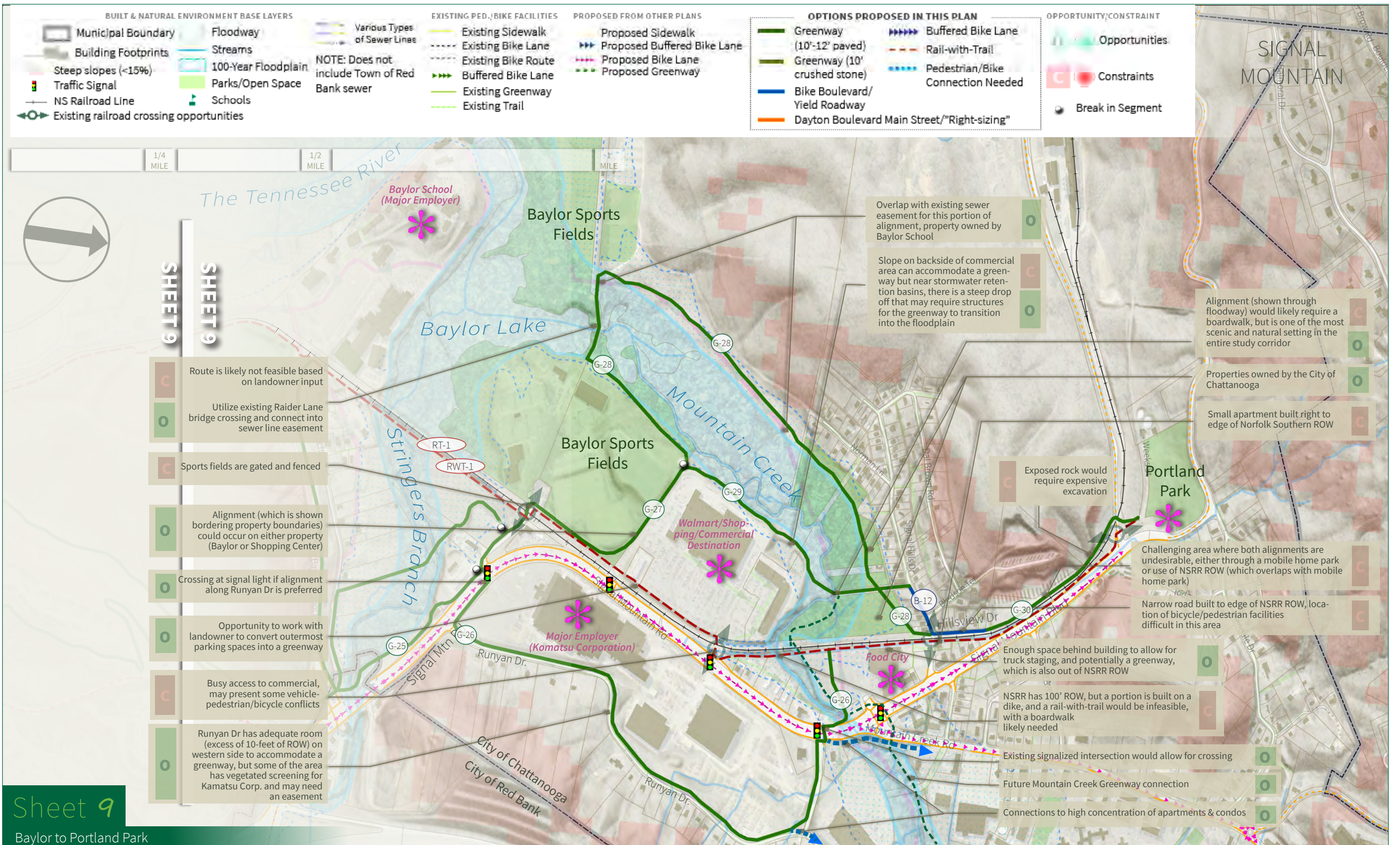


Sheet 7  
North River Soccer Fields









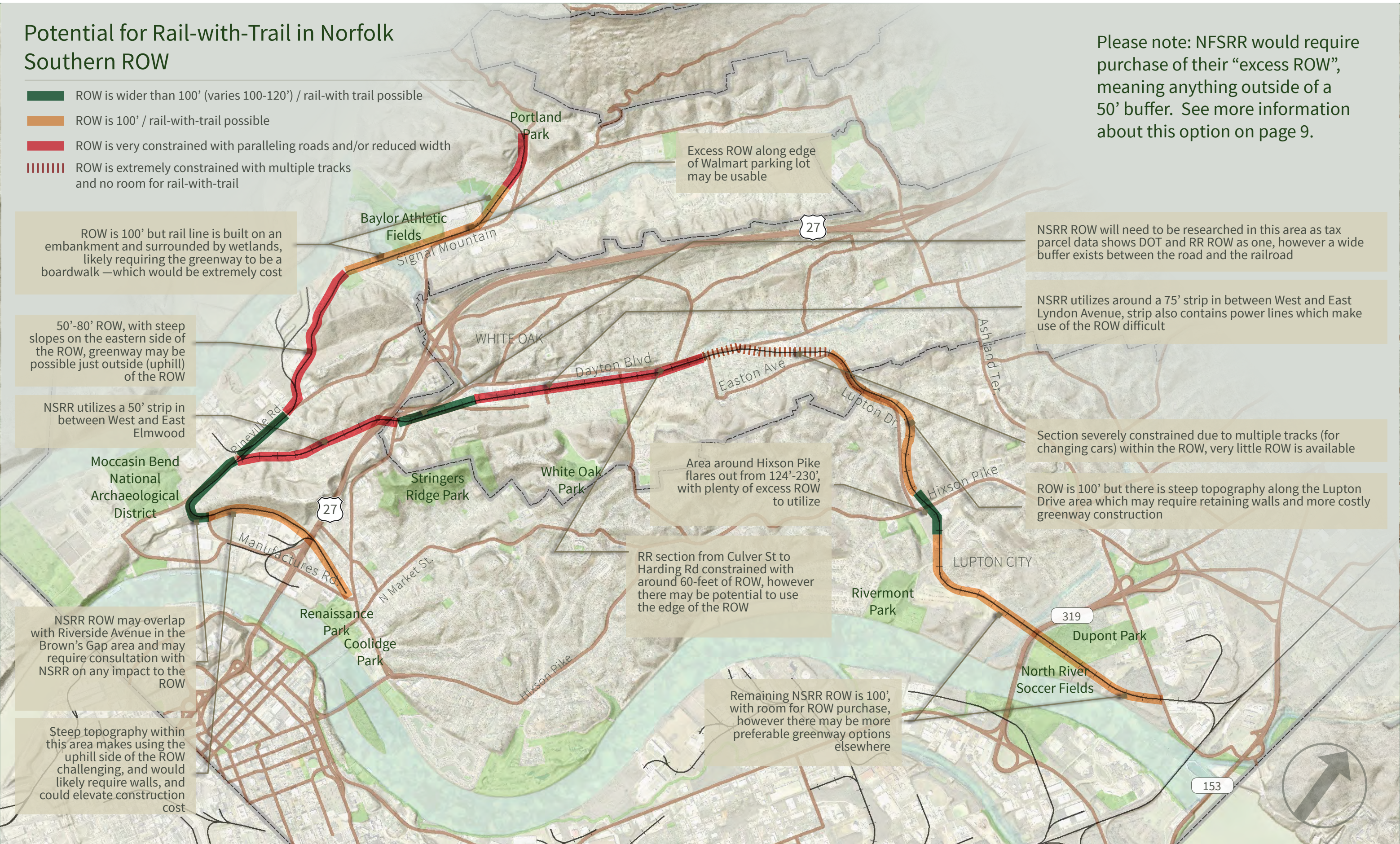
Sheet 9  
Baylor to Portland Park



# Potential for Rail-with-Trail in Norfolk Southern ROW

- ROW is wider than 100' (varies 100-120') / rail-with trail possible
- ROW is 100' / rail-with-trail possible
- ROW is very constrained with paralleling roads and/or reduced width
- ROW is extremely constrained with multiple tracks and no room for rail-with-trail

Please note: NFSRR would require purchase of their “excess ROW”, meaning anything outside of a 50’ buffer. See more information about this option on page 9.



ROW is 100' but rail line is built on an embankment and surrounded by wetlands, likely requiring the greenway to be a boardwalk—which would be extremely cost

50'-80' ROW, with steep slopes on the eastern side of the ROW, greenway may be possible just outside (uphill) of the ROW

NSRR utilizes a 50' strip in between West and East Elmwood

NSRR ROW may overlap with Riverside Avenue in the Brown's Gap area and may require consultation with NSRR on any impact to the ROW

Steep topography within this area makes using the uphill side of the ROW challenging, and would likely require walls, and could elevate construction cost

Excess ROW along edge of Walmart parking lot may be usable

NSRR ROW will need to be researched in this area as tax parcel data shows DOT and RR ROW as one, however a wide buffer exists between the road and the railroad

NSRR utilizes around a 75' strip in between West and East Lyndon Avenue, strip also contains power lines which make use of the ROW difficult

Section severely constrained due to multiple tracks (for changing cars) within the ROW, very little ROW is available

ROW is 100' but there is steep topography along the Lupton Drive area which may require retaining walls and more costly greenway construction

Area around Hixson Pike flares out from 124'-230', with plenty of excess ROW to utilize

RR section from Culver St to Harding Rd constrained with around 60-feet of ROW, however there may be potential to use the edge of the ROW

Remaining NSRR ROW is 100', with room for ROW purchase, however there may be more preferable greenway options elsewhere



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CHAPTER  
**5** *Comparison of Route Options*



RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENT OPTIONS

**OPTIONS PROPOSED IN THIS PLAN**

- Greenway (10'-12' paved)
- Greenway (10' crushed stone)
- Bike Boulevard/Yield Roadway
- Dayton Boulevard Main Street/"Right-sizing"
- Buffered Bike Lane
- Rail-with-Trail
- Pedestrian/Bike Connection Needed
- Bike Route

Note: A rail-trail is possible if the Norfolk Southern Railroad ROW goes up for sale. This has not been displayed in these options.

**EXISTING PED./BIKE FACILITIES**

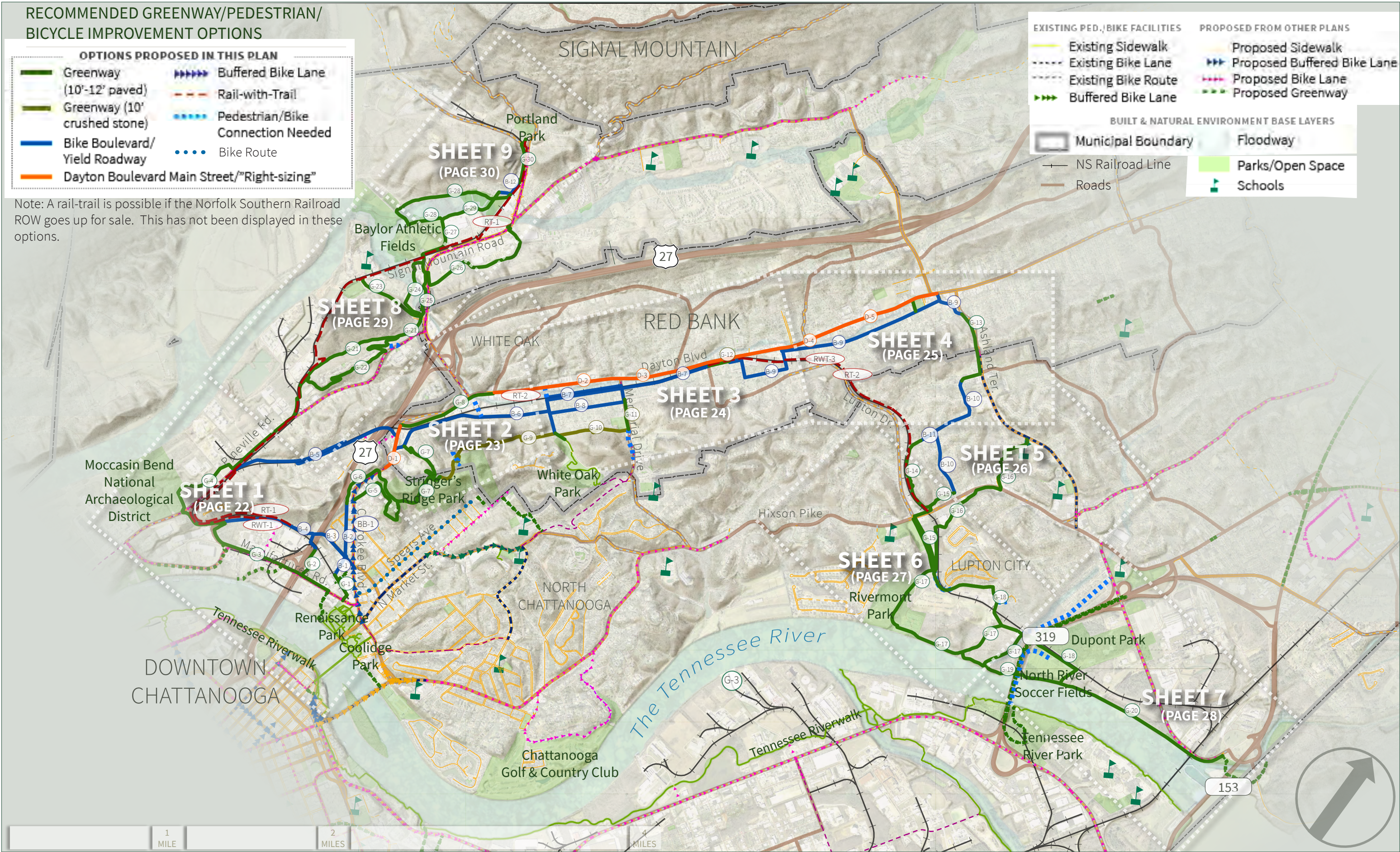
- Existing Sidewalk
- Existing Bike Lane
- Existing Bike Route
- Buffered Bike Lane

**PROPOSED FROM OTHER PLANS**

- Proposed Sidewalk
- Proposed Buffered Bike Lane
- Proposed Bike Lane
- Proposed Greenway

**BUILT & NATURAL ENVIRONMENT BASE LAYERS**

- Municipal Boundary
- NS Railroad Line
- Roads
- Floodway
- Parks/Open Space
- Schools





SECTION	SHEET REFERENCE	Constructability	Connects Ped/Bike Gaps & Improves Safety	Connects to Attractions	Opportunity for Recreation & Social Interaction	Landowner/Neighborhood Support	Cost to Construct	Positive Impact to Tourism and/or Economic Development	Accessible for All to Use/ Ease of Use
		(Including easements, ROW, Utilities, physical constraints (topography))	(Improves safety for bicyclists and pedestrians from roadways, congested areas, crossings, parking)	Connects to regional attractions, commercial, schools, parks, higher density housing, transit, etc.	Provides opportunity for social interaction, neighborhood building, and recreational opportunity	Landowner has indicated they may be amenable, ROW exists, etc.	Cost to construct (compared to average cost for facility type and compared to other routes in the corridor)	Route could increase economic development, redevelopment, and tourism opportunity	Provides the greatest level of use for all abilities from young to old, and all types of bike and pedestrian travel

[illegible]

Note: Landowner support or lack of support will influence the preferred alignment.

SECTION	SHEET	Constructability	Connects Ped/Bike Gaps & Improves Safety	Connects to Attractions	Opportunity for Recreation & Social Interaction	Landowner/ Neighborhood Support	Cost to Construct	Positive Impact to Tourism and/or Economic Development	Accessible for All to Use/ Ease of Use
		(Including easements, ROW, Utilities, physical constraints (topography))	(Improves safety for bicyclists and pedestrians from roadways, congested areas, crossings, parking)	Connects to regional attractions, commercial, schools, parks, higher density housing, transit, etc.	Provides opportunity for social interaction, neighborhood building, and recreational opportunity	Landowner has indicated they may be amendable, ROW exists, etc.	Cost to construct (compared to average cost for facility type and compared to other routes in the corridor)	Route could increase economic development, redevelopment, and tourism opportunity	Provides the greatest level of use for all abilities from young to old, and all types of bike and pedestrian travel

YIELD ROADWAY --> WALK/BIKE BOULEVARD									
Assumptions are made based on Walk-Bike Boulevard, as yield roadways would be considerably less to implement (main cost being traffic calming features) but will have less ease of use for pedestrians									
B-1	1					TBD			
B-2	1&2					TBD			
B-3	1					TBD			
B-4	1					TBD			
B-5	1&2					TBD			
B-6	2&3					TBD			
B-7	3					TBD			
B-8	3					TBD			
B-9	3&4					TBD			
B-10	4					TBD			
B-11	5					TBD			

BUFFERED BIKE LANE (CHEROKEE BLVD.)									
BB-1	1&2					TBD			

DAYTON BOULEVARD MAIN STREET/"RIGHT-SIZING"									
D-1	2					TBD			
D-2	2&3					TBD			
D-3	3					TBD			
D-4	3&4					TBD			
D-5	4					TBD			

RAIL-WITH-TRAIL								
RWT-1	1,8,&9							
RWT-2	3,4,5,&6							

RAIL-TRAIL									
RWT-1	ALL	This option is likely not feasible in the short term							
RWT-2	ALL								

■	■	Highly Favorable
■	■	Somewhat Favorable
■	■	Highly Unfavorable





CHAPTER  
6 *Corridor Design*



RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENT OPTIONS

OPTIONS PROPOSED IN THIS PLAN

- Greenway  
(10'-12' paved)

Bike Boulevard/  
Yield Roadway
- Two-way Cycle Track

Rail-with-Trail

Pedestrian/Bike  
Connection Needed

Bike Route

Break in Segment

EXISTING PED./BIKE FACILITIES

- Existing Sidewalk
- Existing Bike Lane
- Existing Bike Route
- Buffered Bike Lane

PROPOSED FROM OTHER PLANS

- Proposed Sidewalk
- Proposed Buffered Bike Lane
- Proposed Bike Lane
- Proposed Greenway

BUILT & NATURAL ENVIRONMENT BASE LAYERS

- Municipal Boundary
- NS Railroad Line
- Roads
- Floodway
- Parks/Open Space
- Schools



Model miles are proposed to be the first phase of implementation. Cost estimates (construction and land acquisition cost) and more detailed design have been developed for the model miles.



RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENT OPTIONS

**OPTIONS PROPOSED IN THIS PLAN**

- Greenway (10'-12' paved)
- Bike Boulevard/  
Yield Roadway
- Two-way Cycle Track
- Rail-with-Trail
- Pedestrian/Bike  
Connection Needed
- Bike Route

**EXISTING PED./BIKE FACILITIES**

- Existing Sidewalk
- Existing Bike Lane
- Existing Bike Route
- Buffered Bike Lane

**PROPOSED FROM OTHER PLANS**

- Proposed Sidewalk
- Proposed Buffered Bike Lane
- Proposed Bike Lane
- Proposed Greenway

**BUILT & NATURAL ENVIRONMENT BASE LAYERS**

- Municipal Boundary
- NS Railroad Line
- Roads
- Floodway
- Parks/Open Space
- Schools

PHASING

**PHASE 1** / 1-5 YEARS

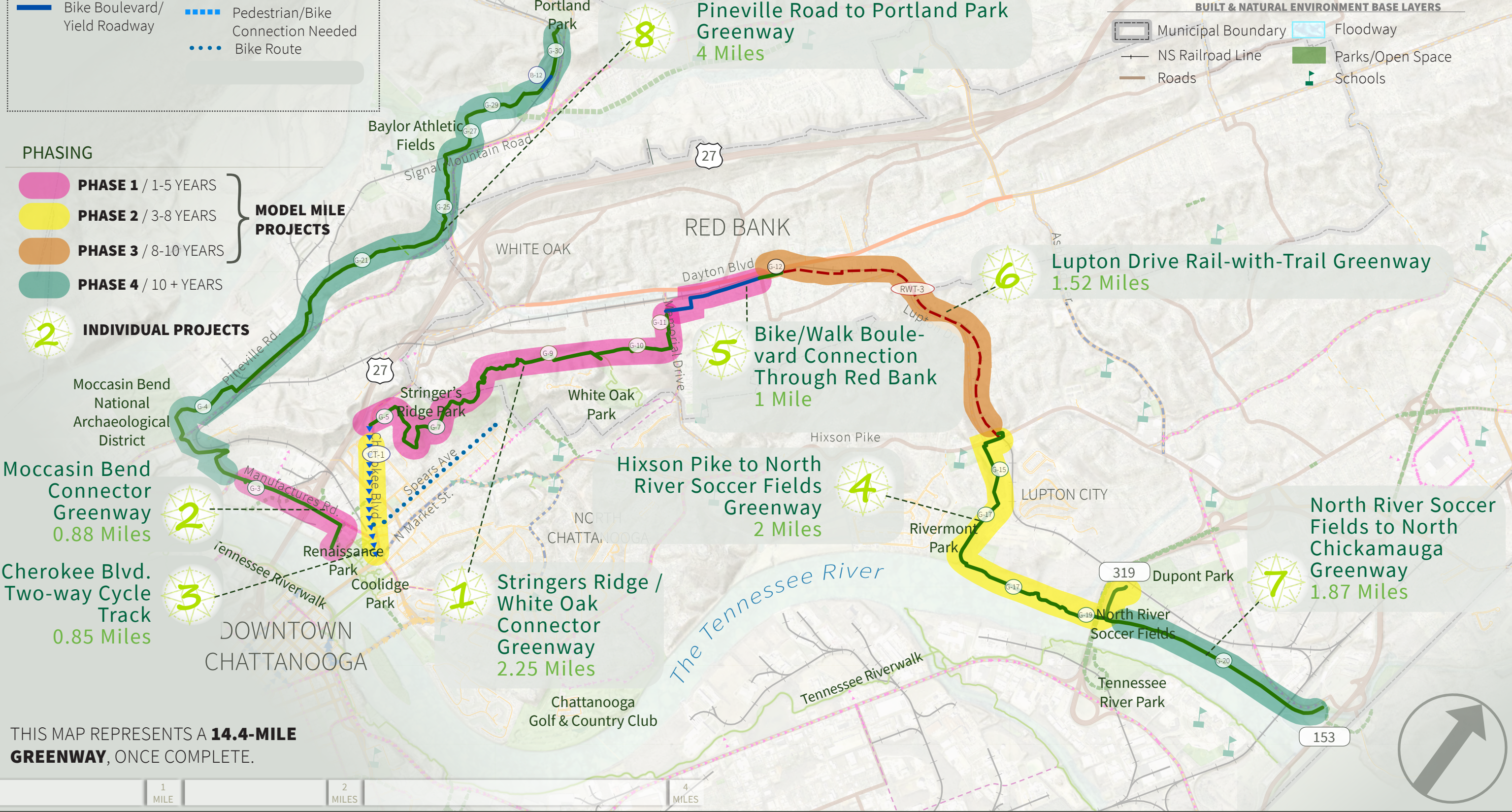
**PHASE 2** / 3-8 YEARS

**PHASE 3** / 8-10 YEARS

**PHASE 4** / 10 + YEARS

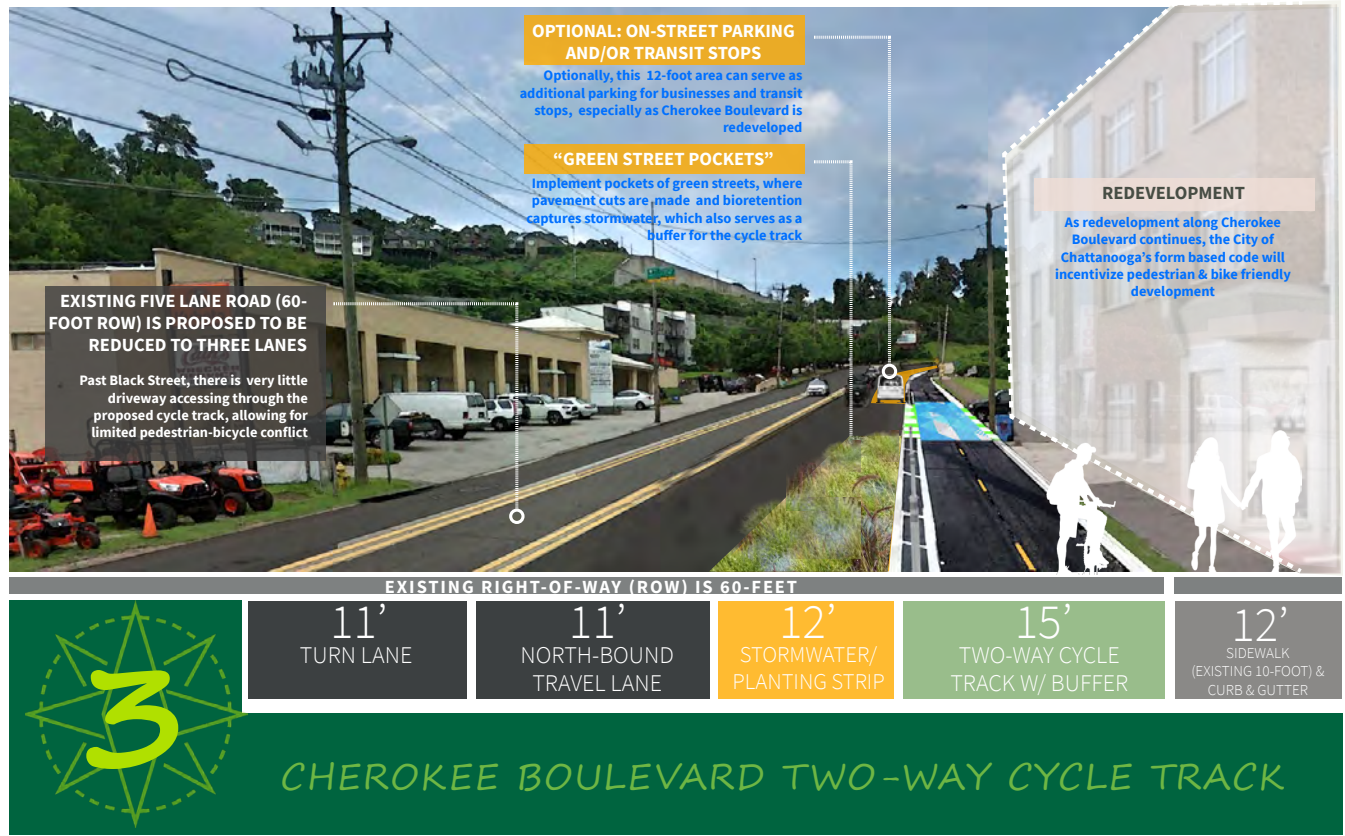
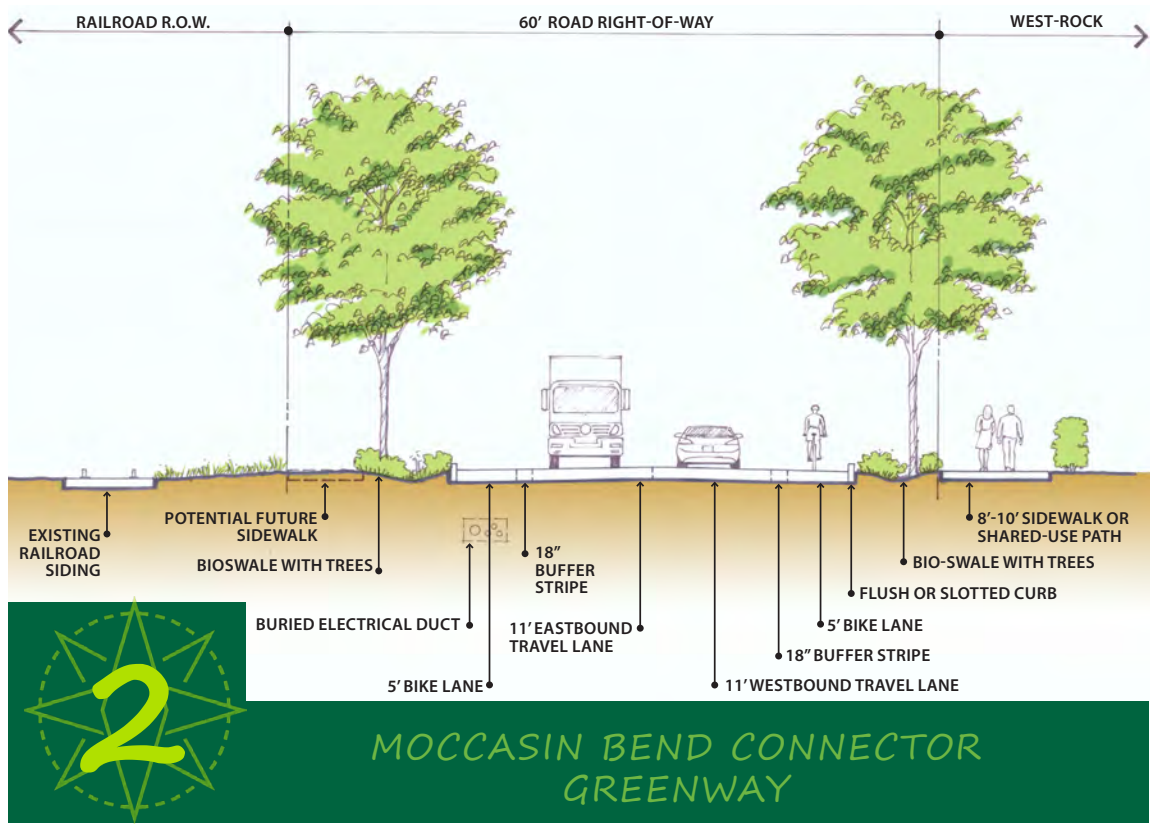
MODEL MILE  
PROJECTS

INDIVIDUAL PROJECTS



THIS MAP REPRESENTS A **14.4-MILE GREENWAY**, ONCE COMPLETE.





Model miles are proposed to be the first phase of implementation. Cost estimates (construction and land acquisition cost) and more detailed design have been developed for the model miles.

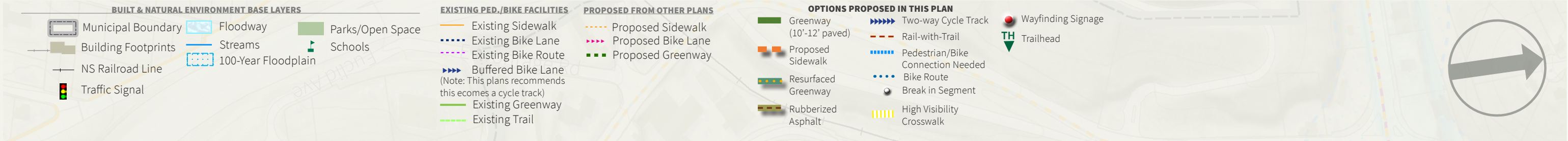


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## FACILITY TYPES











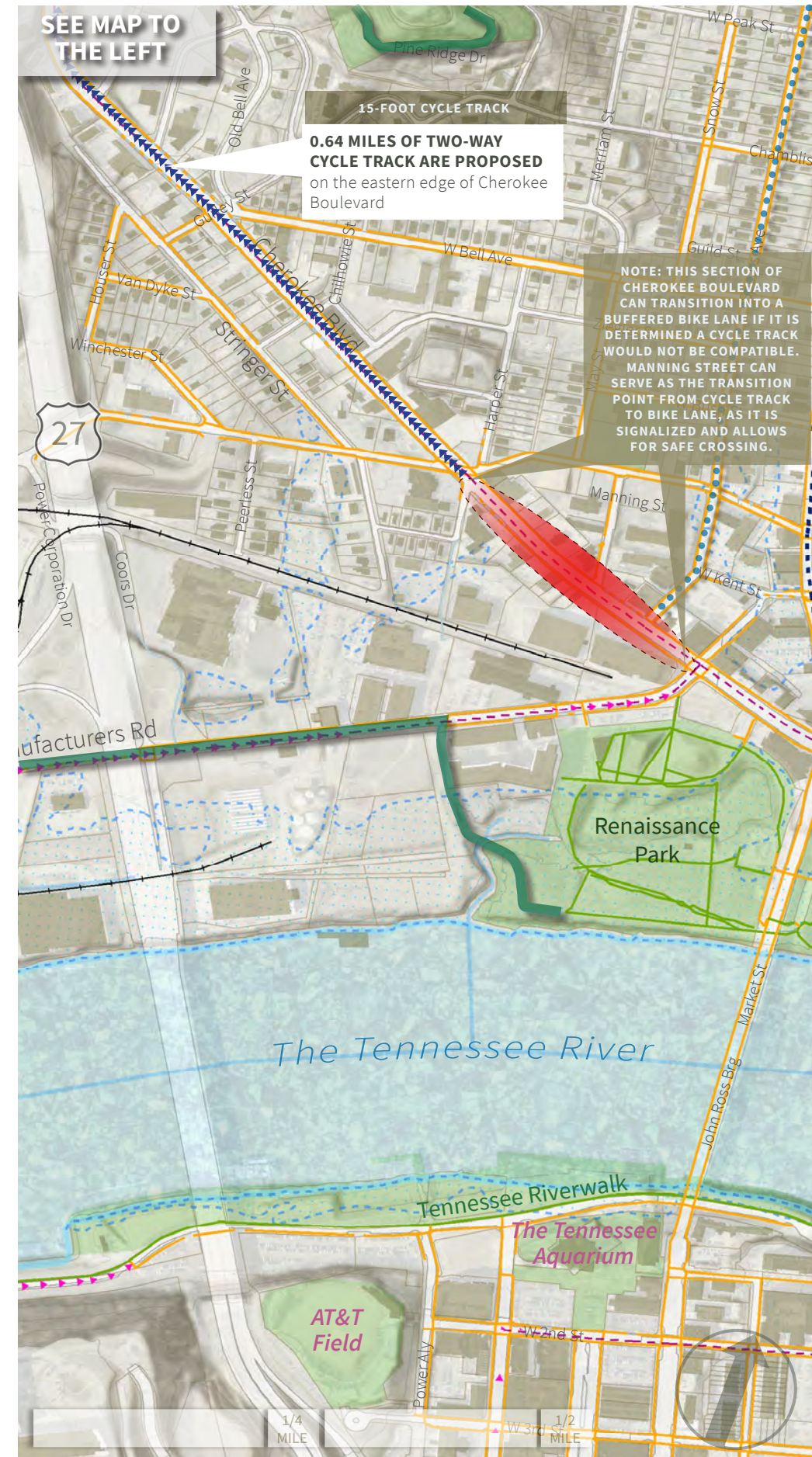
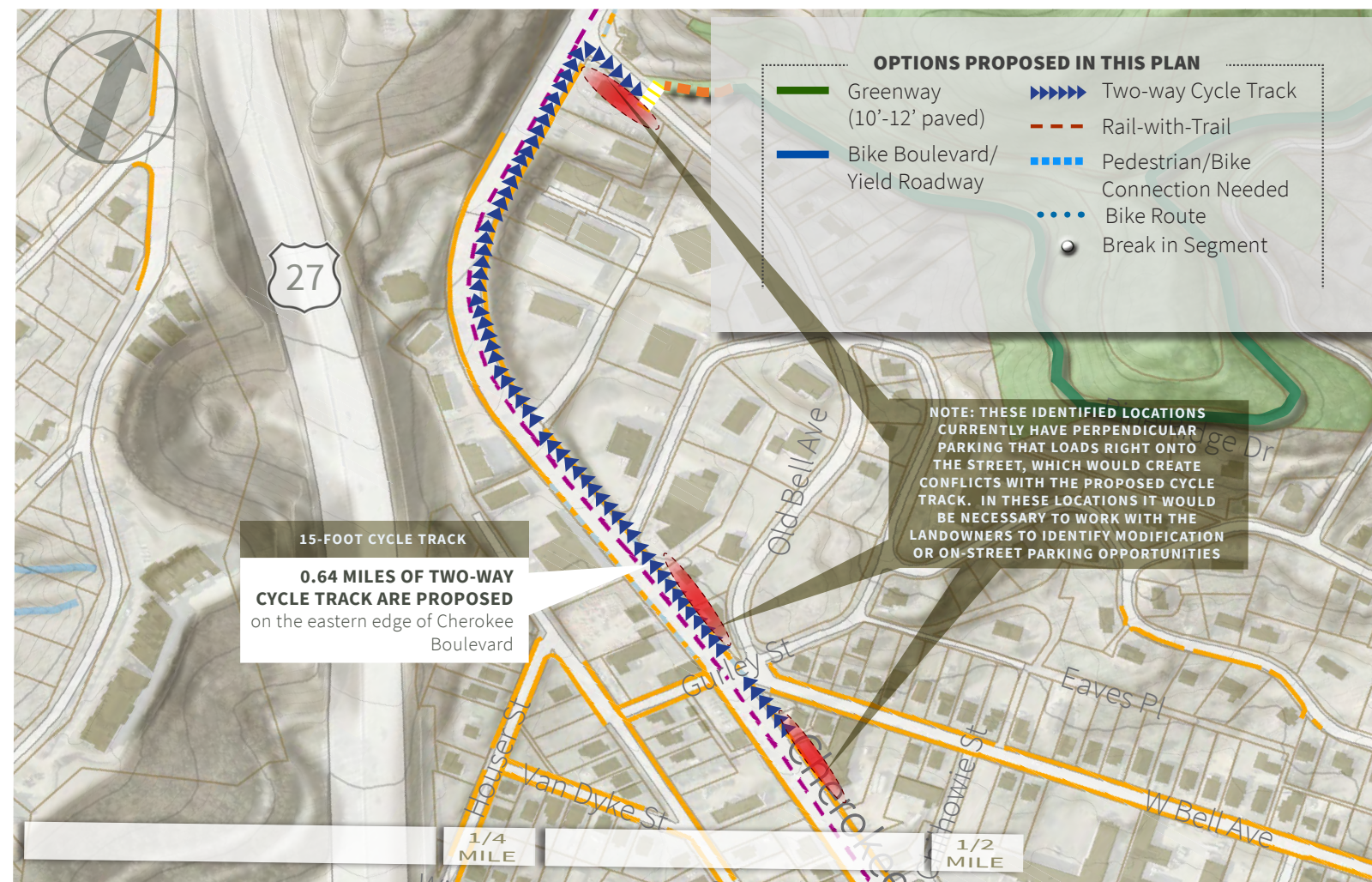
PROJECT 3  
*Cherokee Boulevard  
Cycle Track*

*(Note: **Project 2, Manufacturers Road Greenway**, is not shown in greater detail as it is currently undergoing preliminary engineering)*





EXISTING RIGHT-OF-WAY (ROW) IS 60-FEET					
11'	11'	11'	12'	15'	12'
SOUTH-BOUND TRAVEL LANE	TURN LANE	NORTH-BOUND TRAVEL LANE	STORMWATER/ PLANTING STRIP	TWO-WAY CYCLE TRACK W/ BUFFER	SIDEWALK (EXISTING 10-FOOT) & CURB & GUTTER



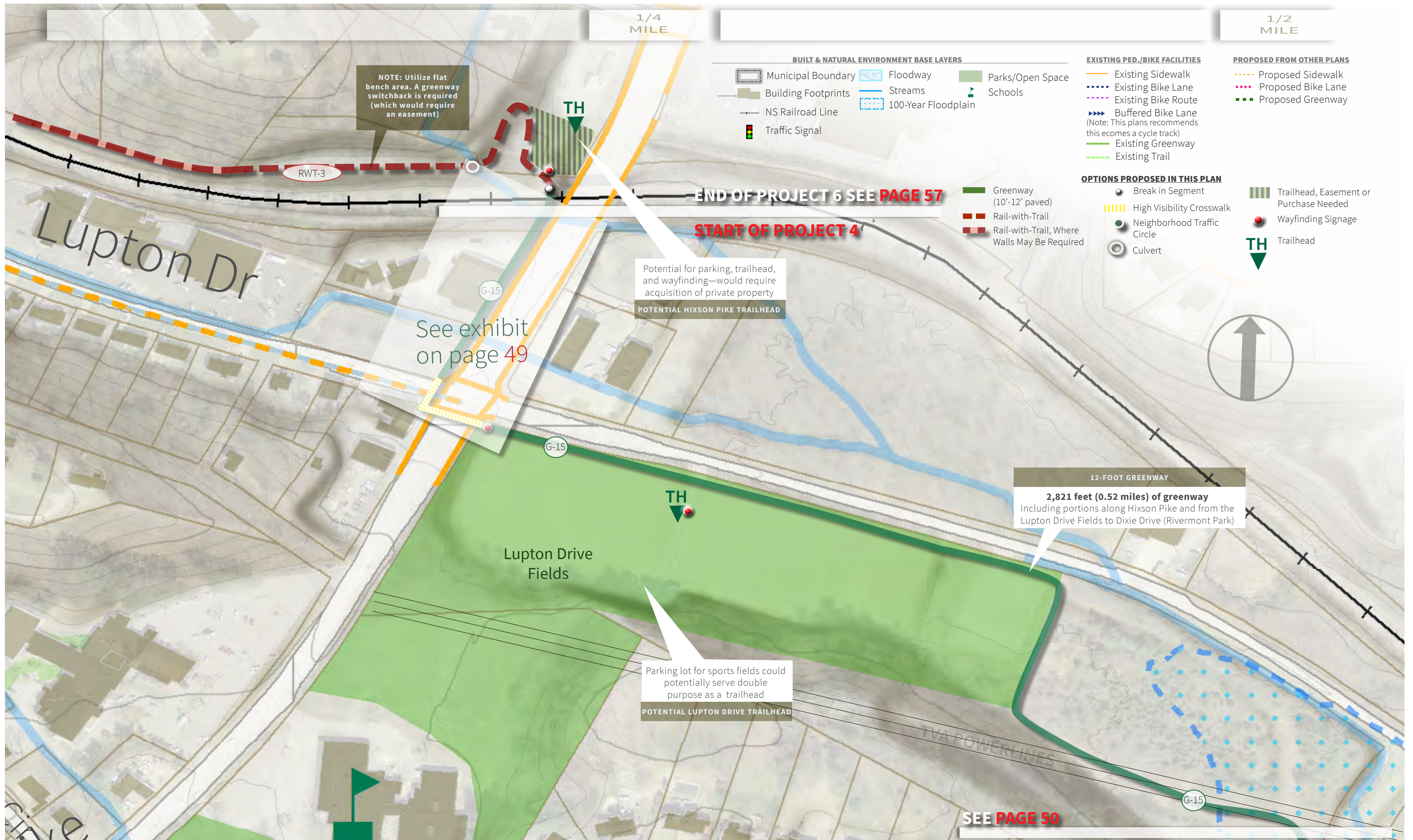




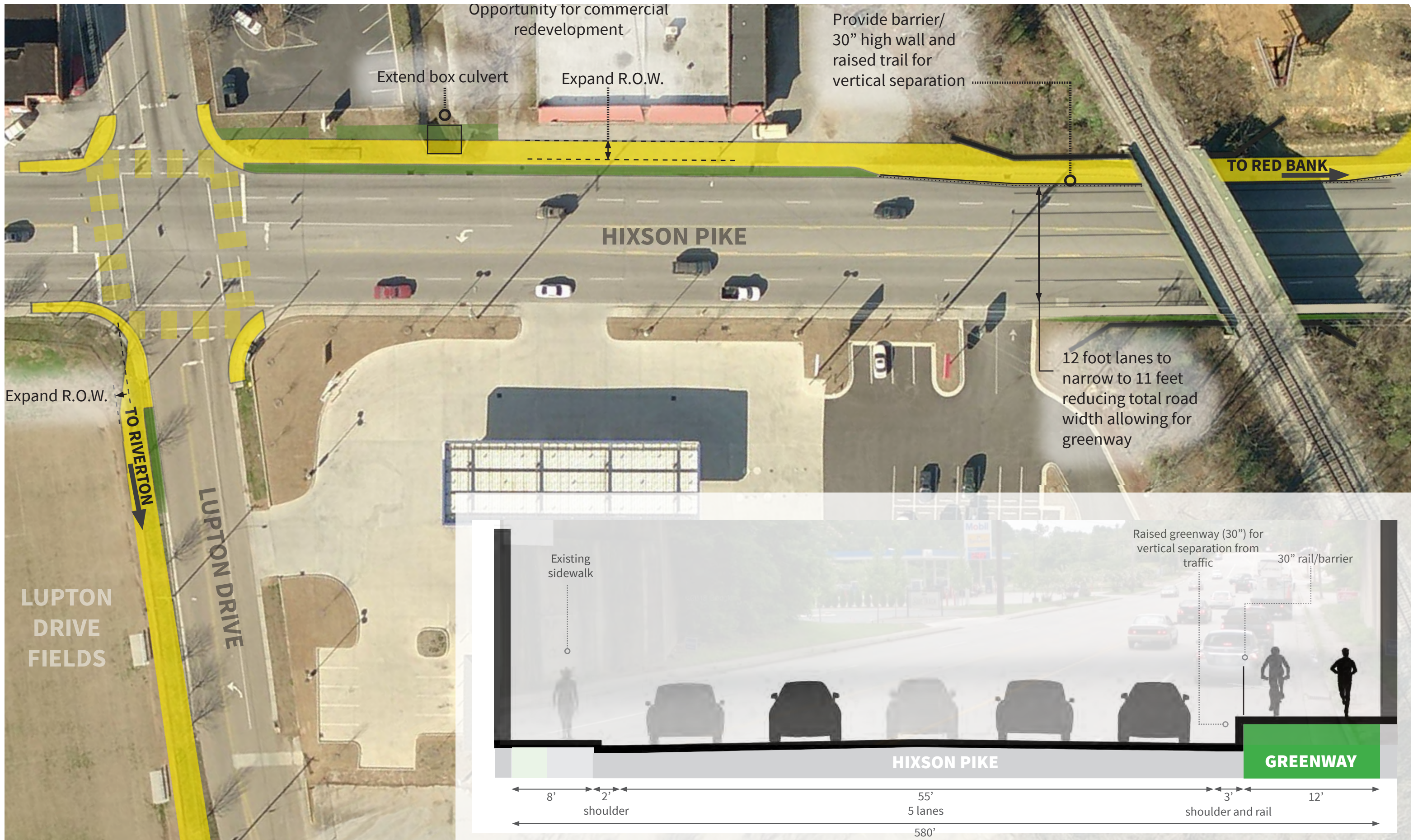
# PROJECT 4

## *Hixson Pike to North River Soccer Fields Greenway*





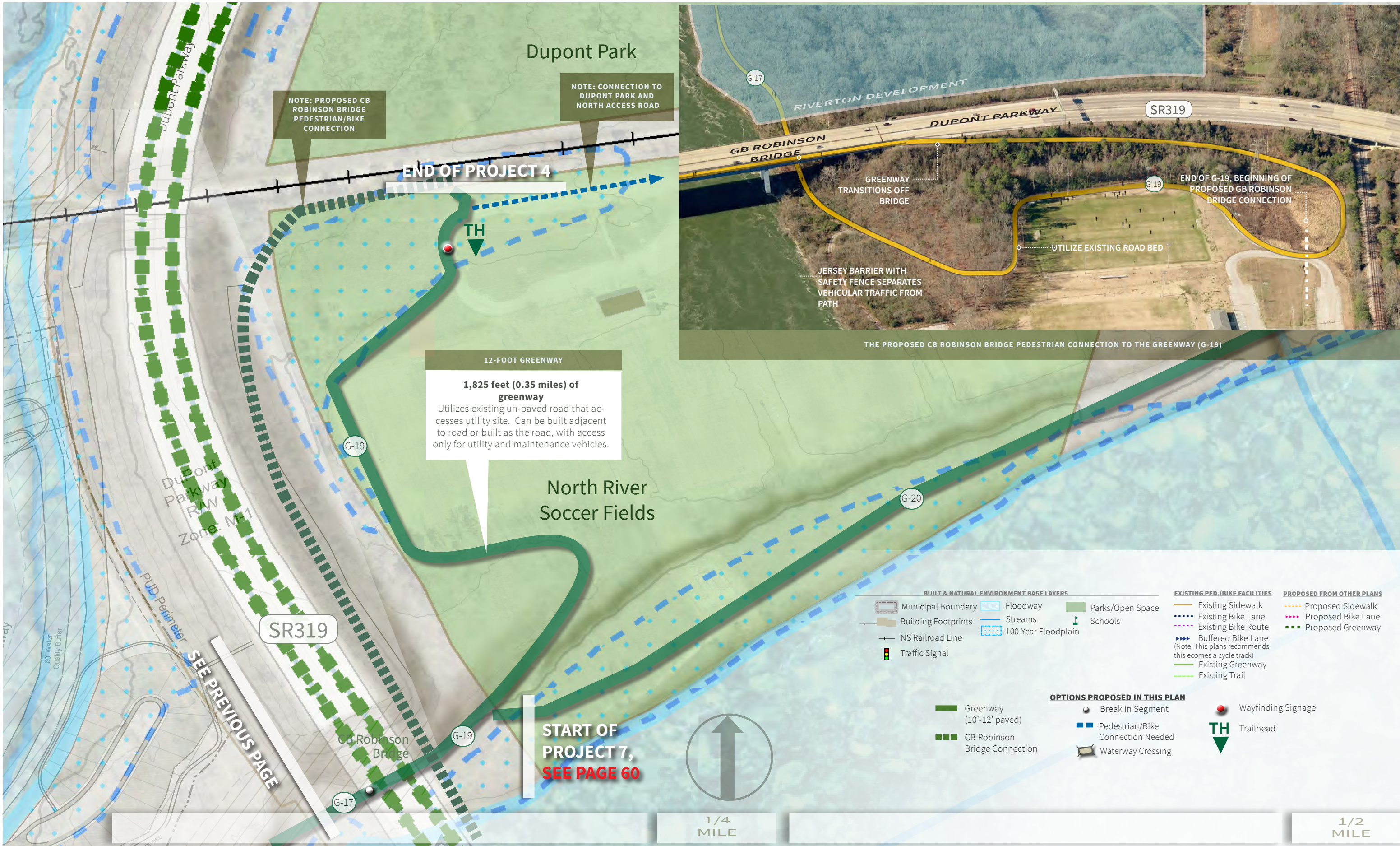














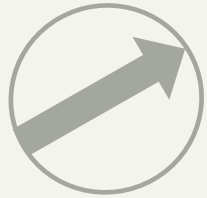
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PROJECTS 5  
*Bike/Walk Boulevard Connection  
Through Red Bank*











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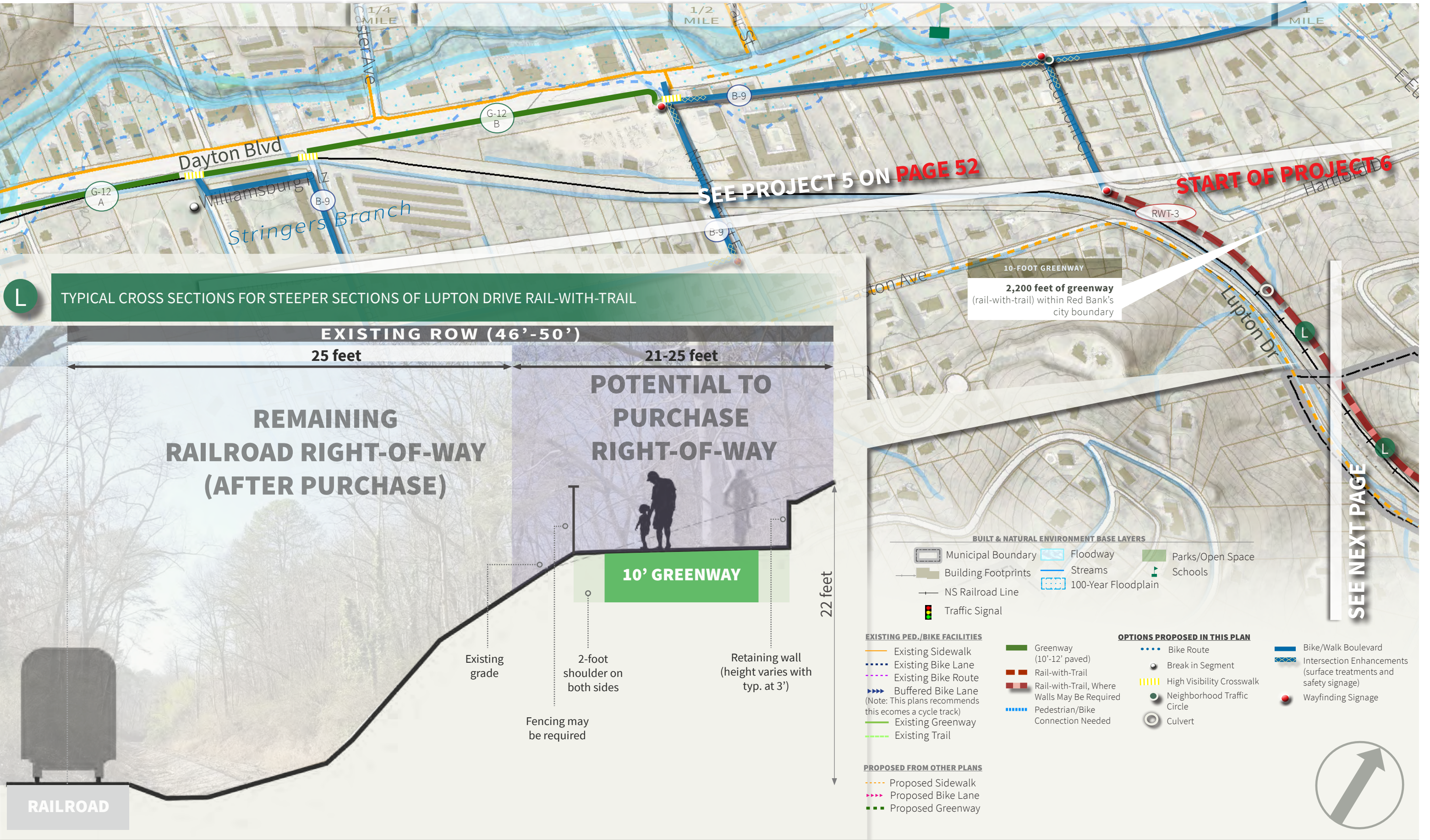




## PROJECT 6

# The Lupton Drive Rail-with-Trail Greenway









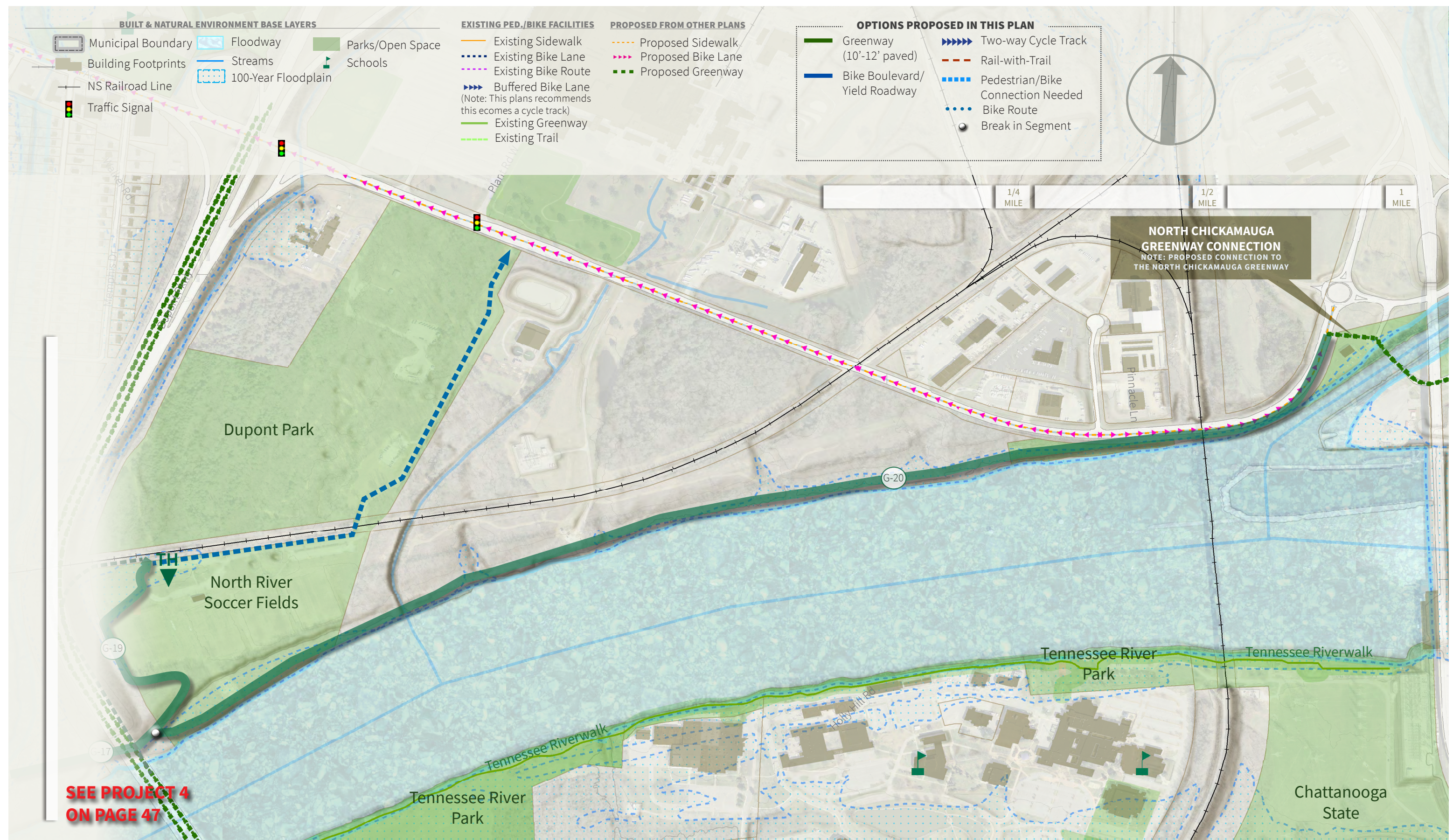




## PROJECT 7

# North River Soccer Fields to North Chickamauga Greenway



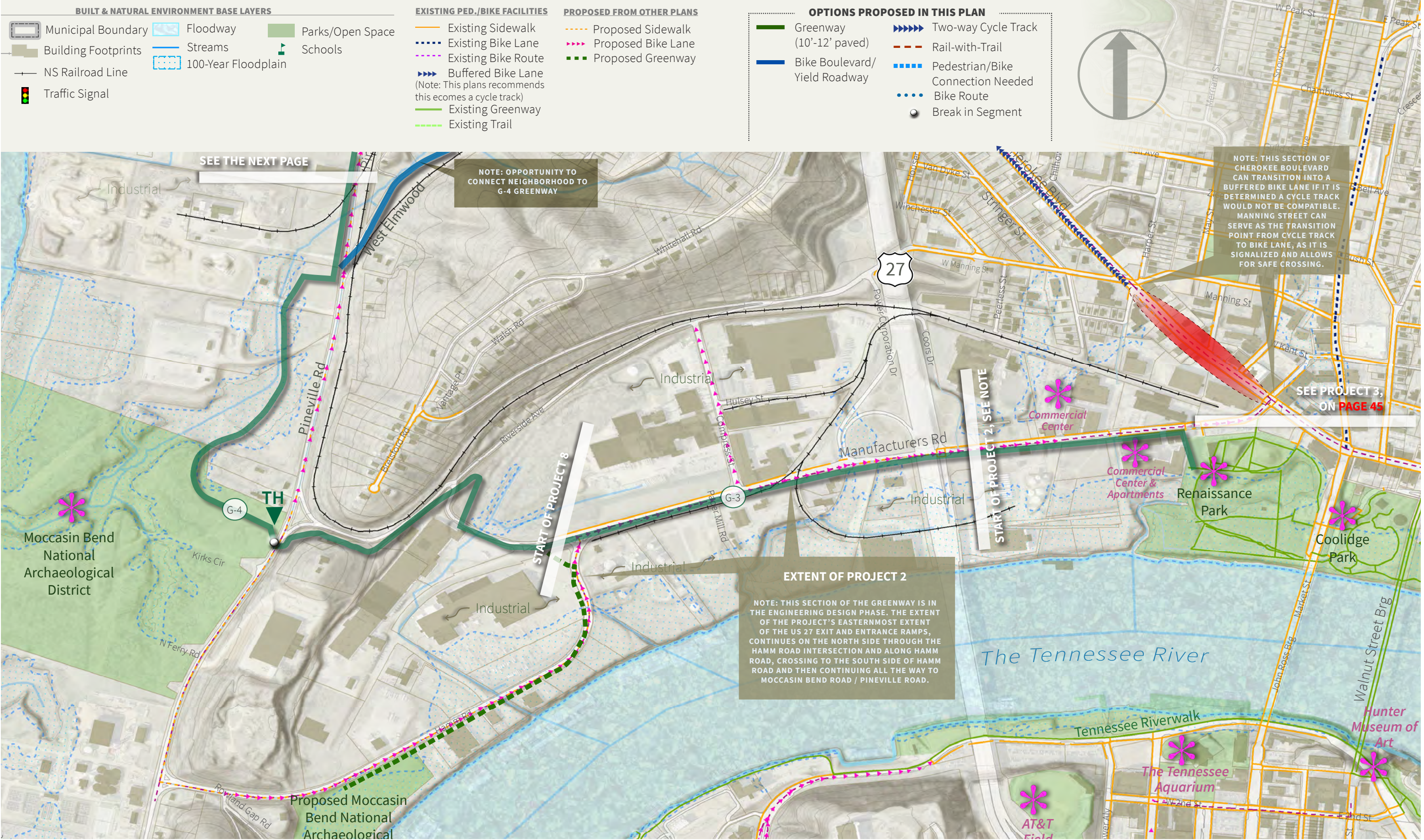






PROJECT 8  
*Pineville Road to Portland Park Greenway*







**BUILT & NATURAL ENVIRONMENT BASE LAYERS**

Municipal Boundary

Building Footprints

NS Railroad Line

Traffic Signal

Floodway

Streams

100-Year Floodplain

Parks/Open Space

Schools

**EXISTING PED./BIKE FACILITIES**

Existing Sidewalk

Existing Bike Lane

Existing Bike Route

Buffered Bike Lane  
(Note: This plan recommends this becomes a cycle track)

Existing Greenway

Existing Trail

**PROPOSED FROM OTHER PLANS**

Proposed Sidewalk

Proposed Bike Lane

Proposed Greenway

**OPTIONS PROPOSED IN THIS PLAN**

Greenway  
(10'-12' paved)

Bike Boulevard/  
Yield Roadway

Two-way Cycle Track

Rail-with-Trail

Pedestrian/Bike  
Connection Needed

Bike Route

Break in Segment











CHAPTER  
7  
Recommendations Moving Forward





# Recommendations Moving Forward

## Finding Allies To Champion the Plan

- **Find a local influencer that is willing to have conversations with Norfolk Southern Railroad.** Find a representative that has decision making authority and that has a relationship with NSRR at a state and national level. Build relationships with your local NSRR real estate representatives and continue the dialogue as part of a “long-game” approach.
- **Establish a local charismatic leader that can help champion the plan and meet with other influencers.** A charismatic leader can be someone that is well-respected within the community, has many political connections, and is ready to be engaged in the “long-game” of not only seeing portions implemented, but has an “eye on the prize.”
- **Ask business owners, developers, political officials, and others to help you build a consortium of influencers that can serve as a network that reaches out to their community.** Hold one-on-one or group meetings to get influencers up to speed and have an “ask” for them when you finish.
- **Meet with Red Bank and the City of Chattanooga elected officials** one-on-one or in small groups to educate them on the plan and determine where their priorities lie.

## Early Landowner Outreach

- **Reach out to major landowners that could make or break this plan.** Have conversations with major landowners early to weigh whether or not they would be amenable. Often it takes multiple conversations and a long-term commitment to have landowners to come around to the idea of dedicating easements. Continue the dialogue with the landowners who were contacted as part of initial phases of the North Shore Greenway Plan.

## Coordination with TDOT

Some of the following coordination should occur with TDOT to implement this plan:

- **Engage in early meetings with TDOT about the Dayton Boulevard “right-sizing” if it is determined it is a priority.** Engage early to understand the likelihood of this proposal, and if TDOT would likely require a further study to show how this concept would affect safety and still meet level of service for vehicles. Some of the following questions should include:
  - Could any consideration be given to investigating a reduction of Dayton Boulevard (SR 8) vehicular traffic lanes from four to two or three, from the Stringers Ridge tunnel to the US 27 entry / exit ramps?
  - Could any consideration be given to investigating major intersection improvements to the Dayton Boulevard (SR 8) intersections at Ashmore Avenue and East Frontage Road?
  - Could any consideration be given to slightly narrowing the existing Dayton Boulevard (SR 8) vehicular travel lanes between the US 27 entry / exit ramps and the Signal Mountain Road intersection?
  - Could any consideration be given to otherwise encroaching upon US 27 rights-of-way for development of bike / pedestrian facilities?
- **Have discussions with TDOT about the preferred crossing of Dupont Parkway. The two locations and questions that should be asked are:**
  - Under the DuPont Parkway (SR 319) bridge over the NSRR (Chattanooga Traction Company [CTC]) right-of-way, could consideration be given to utilizing the available open space between the bridge piers and abutments for bike / pedestrian facilities?
  - Under the C.B. Robinson Bridge over the Tennessee River, could consideration be given to utilizing the shoreline under the north abutment for bike / pedestrian facilities?

## Consider Implementing Yield Roadways in the Short-Term

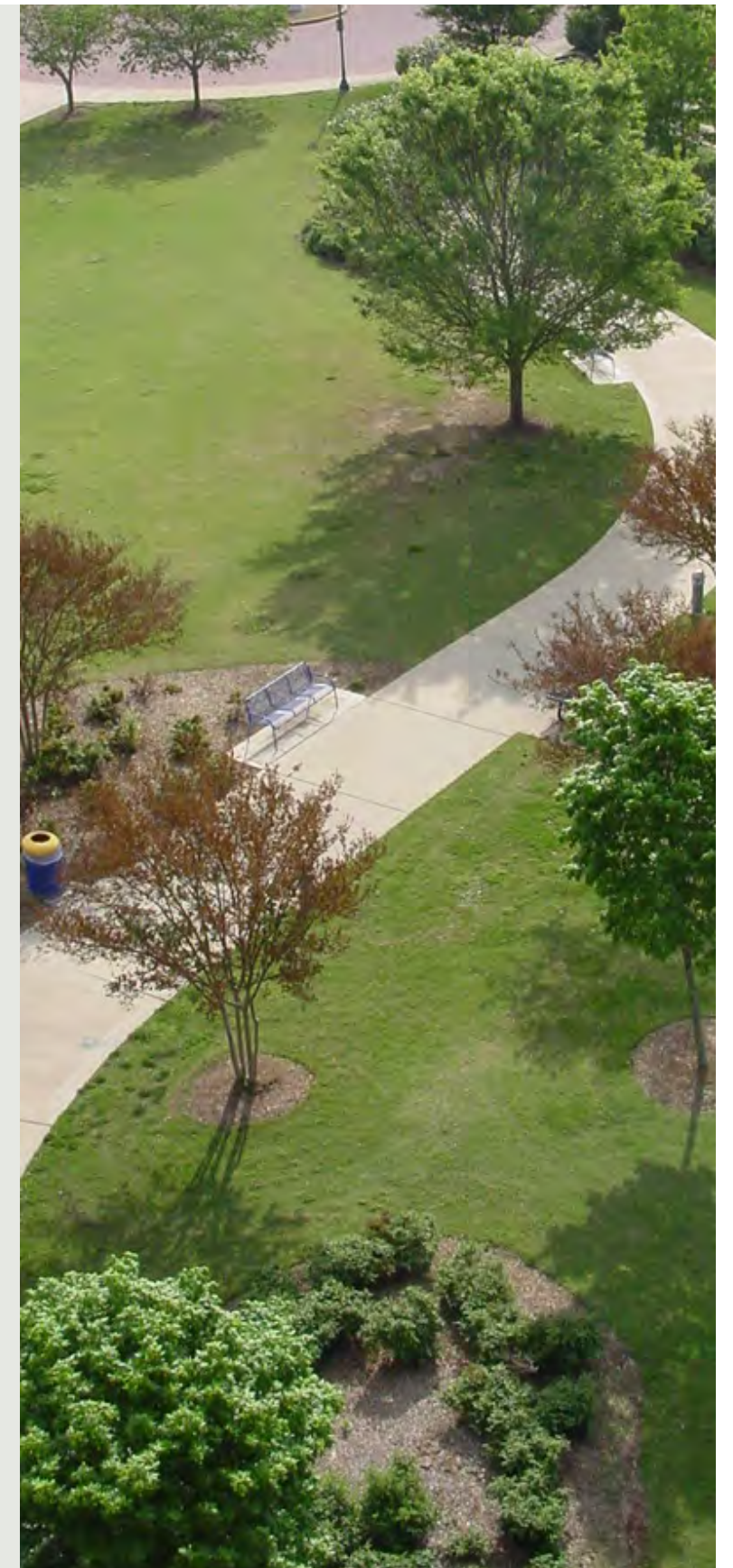
- **Yield roadways are a low-cost solutions for improved bicycle facilities while greenway sections are under development.** Yield roadways will help raise awareness of bicyclists using low-traffic routes through markings and signage. These routes could ultimately transition into bike/walk boulevards which would connect to several proposed greenways, connecting neighborhoods to greenway “arterials.”

## Consider Branding for the Proposed Greenways

- **Consider naming the proposed greenways early on to help build identity around them.** These greenways could have names associated with the North Shore, naming right, etc. Since there are multiple separated greenways, naming would help create awareness around them.

## Consider An Immediate Greenway Project

- **Consider Concentrating on the first immediate greenway project from Hixson Pike to the North River Soccer Fields.** These greenway segments (segments G-15, G-17, and G-19) would be the most strategic to pursue as an immediate next phase. It is strategic since one major landowner is willing to have conversations, there are multiple public parcels, it connects two parks, and may spur redevelopment of the Lupton City Mill site.





**MEMORANDUM**

April 3, 2018

FROM: Terry D. Reynolds, A.I.C.P.  
TO: Kimberly M. Williams, Equinox Environmental  
RE: North Shore Greenway meeting with Norfolk Southern Corporation Representative

On Wednesday, March 28, 2018 I met with Norfolk Southern Corporation (NSRR) Real Estate Representative Jason Chapman ([jason.chapman@nscorp.com](mailto:jason.chapman@nscorp.com)) regarding the interface NSRR rights-of-way and facilities and the proposed North Shore Greenway (NSG). He was very open and candid in discussions on a number of issues, some of which may be flexible and some less so.

In previous research, on previous projects and in previous discussions with Mr. Chapman, a number of NSRR positions were already clearly understood:

- Among the many priorities which NSRR must manage, the efficient, effective, profitable movement of freight and safe operations are well above any and all other priorities
- NS generally has to pay full market value for the rights-of-way occupied and expects to be remunerated accordingly if current properties are to be released
- Like other Class I railroads and for safety reasons, NSRR is generally opposed to bicycle and pedestrian facilities within close proximity to active rail facilities (see attached p.9 of the 2013.07.01 NSRR Public Projects Manual dealing specifically with bicycle-pedestrian trails and crossings)

Below is a summary of my notes of the meeting with Mr. Chapman:

- During initial discussions Mr. Chapman and I toured the affected NSRR facilities and rights-of-way corridors in relation to the proposed NSG and noted particular locations where the two might be most likely to interface
- Current ownership issues:
  1. Predecessors of the current NSRR apparently purchased all Chattanooga Traction Company right-of-way and facilities approximately 80 years ago and have owned them ever since and projects continued active rail operations on the facilities there for the foreseeable future
  2. Although the affected rights-of-way were owned by NSRR, et al, in approximately 2000, when TDOT acquired a narrow slice of the right-of-way along Signal Mountain Road during a widening project, Mr. Chapman was personally unfamiliar with the acquisition process used at that time

3. Although the affected rights-of-way were apparently owned by NSRR, et al, if and when owners of the (now) Food City on Signal Mountain Road similarly apparently acquired a slice of the same right-of-way adjacent to its property, if so, Mr. Chapman was also personally unfamiliar with the acquisition processed used for it at that time
4. However any previous acquisitions may or may not have been made, current policies of NSRR would govern any current potential acquisition negotiations

- It is the opinion of Mr. Chapman that it is conceivable that NSRR may give consideration to selling any surplus portions of the affected rights-of-way edges not needed for the safe operation of trains to an appropriate entity (but never less than a 50'-wide right-of-way); however, any negotiations toward such a sale would involve a fair market appraisal as well as a strategic assessment on the part of NSRR that divestment of the subject real estate would not have a detrimental effect on its ongoing operations, etc., which may include a requirement for the provision of additional security measures, etc.
- It is the opinion of Mr. Chapman that it is highly unlikely that NSRR may give consideration to allowing bicycle and pedestrian access to the limited vehicular access Power Corporation Drive and the grade separation there under the US 27 bridge
- It is the opinion of Mr. Chapman that NSRR would oppose adding bicycle and / or pedestrian accommodations to or any other related enticements for bicycle and / or pedestrian traffic at any existing at-grade street or road crossing of its active rail facilities
- It is the opinion of Mr. Chapman that NSRR would oppose allowing further Chattanooga public street and / or road encroachment onto the Browns Gap segment of the NSRR right-of-way, where street and rail facilities currently appear to share a common right-of-way, except to say that if bicycle and pedestrian facilities were created on the opposite side of the road, such facilities could possibly be considered
- It is the opinion of Mr. Chapman that NSRR may be willing to grant an easement to construct an overhead grade-separated bicycle-pedestrian bridge over an active rail facility in order to avoid an at-grade crossing
- It is the opinion of Mr. Chapman that NSRR may be willing to grant an easement to construct a grade-separated bicycle-pedestrian facility culvert under the embankment of an active rail facility in order to avoid an at-grade crossing, but construction of such an embankment culvert would be much less likely to be approved than an overhead bridge
- It is the opinion of Mr. Chapman that if a bicycle-pedestrian facility were to be constructed flanking North Access Road under Ten Bridge that NSRR would have serious concerns over the need for adequate protections provided against the possibility of falling debris from the active rail facilities above, etc.
- It is the opinion of Mr. Chapman that if in the future any portions of these or other current rail lines were to be considered no longer economically viable that NSRR could consider leasing the right-of-way under terms of a no more than nine-year lease with provisions for termination with a 30-day notice, or possibly selling the right-of-way, subject to approval of internal NSRR strategic planning officials and appraisal of fair market value, etc.

(see attached p. 9 of the 2013.07.01 NSRR Public Projects Manual, dealing specifically with bicycle / pedestrian trails and crossings)





CHAPTER

8

# *Cost Estimates & Phasing*



RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENT OPTIONS

- OPTIONS PROPOSED IN THIS PLAN**
- Greenway (10'-12' paved)
  - Bike Boulevard/Yield Roadway
  - Two-way Cycle Track
  - Rail-with-Trail
  - Pedestrian/Bike Connection Needed
  - Bike Route

- EXISTING PED./BIKE FACILITIES**
- Existing Sidewalk
  - Existing Bike Lane
  - Existing Bike Route
  - Buffered Bike Lane
- PROPOSED FROM OTHER PLANS**
- Proposed Sidewalk
  - Proposed Buffered Bike Lane
  - Proposed Bike Lane
  - Proposed Greenway
- BUILT & NATURAL ENVIRONMENT BASE LAYERS**
- Municipal Boundary
  - NS Railroad Line
  - Roads
  - Floodway
  - Parks/Open Space
  - Schools

PHASING

- MODEL MILE PROJECTS**
- PHASE 1** / 1-5 YEARS
  - PHASE 2** / 3-8 YEARS
  - PHASE 3** / 8-10 YEARS
  - PHASE 4** / 10+ YEARS

**2 INDIVIDUAL PROJECTS**

Moccasin Bend National Archaeological District

**Moccasin Bend Connector Greenway**  
0.88 Miles (NOT COSTED)

**Cherokee Blvd. Two-way Cycle Track**  
0.85 Miles (NOT COSTED)

**PROJECT 3 ANTICIPATED COST: \$3,302,500**

THIS MAP REPRESENTS A **14.4-MILE GREENWAY**, ONCE COMPLETE.

**Stringers Ridge / White Oak Connector Greenway**  
2.25 Miles

**PROJECT 1 ANTICIPATED COST: \$2,295,280**

**Hixson Pike to North River Soccer Fields Greenway**  
2 Miles

**PROJECT 4 ANTICIPATED COST: \$4,375,900**

**Bike/Walk Boulevard Connection Through Red Bank**  
1 Mile

**PROJECT 5 ANTICIPATED COST: \$403,230**

**Lupton Drive Rail-with-Trail Greenway**  
1.52 Miles

**PROJECT 6 ANTICIPATED COST: \$2,363,850**

**North River Soccer Fields to North Chickamauga Greenway**  
1.87 Miles (NOT COSTED)

**7**

**Pineville Road to Portland Park Greenway**  
4 Miles (NOT COSTED)

**8**



RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENT OPTIONS

- OPTIONS PROPOSED IN THIS PLAN**
- Greenway (10'-12' paved)
  - Bike Boulevard/Yield Roadway
  - Two-way Cycle Track
  - Rail-with-Trail
  - Pedestrian/Bike Connection Needed
  - Bike Route

- EXISTING PED./BIKE FACILITIES**
- Existing Sidewalk
  - Existing Bike Lane
  - Existing Bike Route
  - Buffered Bike Lane
- PROPOSED FROM OTHER PLANS**
- Proposed Sidewalk
  - Proposed Buffered Bike Lane
  - Proposed Bike Lane
  - Proposed Greenway
- BUILT & NATURAL ENVIRONMENT BASE LAYERS**
- Municipal Boundary
  - NS Railroad Line
  - Roads
  - Floodway
  - Parks/Open Space
  - Schools

PHASING

- MODEL MILE PROJECTS**
- PHASE 1** / 1-5 YEARS
  - PHASE 2** / 3-8 YEARS
  - PHASE 3** / 8-10 YEARS
  - PHASE 4** / 10+ YEARS

**INDIVIDUAL PROJECTS**

Moccasin Bend National Archaeological District

**Moccasin Bend Connector Greenway**  
0.88 Miles (NOT COSTED)

**Cherokee Blvd. Two-way Cycle Track**  
0.85 Miles (NOT COSTED)

**PROJECT 3 ANTICIPATED COST: (USES ROW)**

THIS MAP REPRESENTS A **14.4-MILE GREENWAY**, ONCE COMPLETE.

DOWNTOWN CHATTANOOGA

**Stringers Ridge / White Oak Connector Greenway**  
2.25 Miles

**PROJECT 1 ANTICIPATED COST: APPROX. \$47,500**

**Hixson Pike to North River Soccer Fields Greenway**  
2 Miles

**PROJECT 4 ANTICIPATED COST: APPROX. \$837,630**

**Bike/Walk Boulevard Connection Through Red Bank**  
1 Mile

RED BANK

**PROJECT 5 ANTICIPATED COST: APPROX. \$61,730**

**Lupton Drive Rail-with-Trail Greenway**  
1.52 Miles

**PROJECT 6 ANTICIPATED COST: APPROX. \$874,060**

**North River Soccer Fields to North Chickamauga Greenway**  
1.87 Miles (NOT COSTED)

**PROJECT 7**





COSTS FOR MODEL MILES ONLY...

CONSTRUCTION COST

EASEMENT COST

PHASE 1	PROJECT 1 Stringers Ridge /White Oak Connector Greenway 2.25 Miles	\$2,295,280	\$47,500
	PROJECT 2 Moccasin Bend Connector Greenway 0.88 Miles	Cost and design currently being developed as part of a separate projects	Cost and design currently being developed as part of a separate projects
	PROJECT 5 Bike/Walk Boulevard Connection Through Red Bank 1 Mile	\$403,230	\$61,730
PHASE 2	PROJECT 3 Cherokee Blvd. Two-way Cycle Track 0.85 Miles	\$3,302,500	Uses Cherokee Boulevard Road ROW
	PROJECT 4 Hixson Pike to North River Soccer Fields Greenway 2 Miles	\$4,375,900	\$837,630
PHASE 3	PROJECT 6 Lupton Drive Rail-with-Trail Greenway 1.52 Miles	\$2,363,850	\$874,060
	TOTAL COSTS	~\$12.8 MILLION	~\$1.8 MILLION

Important Information About Construction Cost Estimates:

- Cost estimates are preliminary and subject to change. Inflation of 20-30% annual of cost should be considered when using for future planning and implementation.
- A 40% contingency was added to each phase, as planning level costs often cannot anticipate some detailed costs. A contingency will assure wiggle room for any unanticipated costs.
- Do not use cost estimates for grant application after 2020, without verifying costs with a professional estimator.
- These are planning level costs. Detail level costs that use a survey and detailed design will be more accurate.

Important Information About Easement Cost Estimates:

- Information is based on adjacent land values (excluding building values) using Hamilton County tax assessment records. It assumes a cost per acre, which is applied to a typical easement of 10-'50' (depending on conditions).
- This assumes easement donations, however, it is typical that some or much of a greenway corridor is done by donation or bargain sale, reducing the overall cost for greenway corridor acquisition.





CHAPTER

9



Trail Operations, Maintenance & Security





# Trail Operations, Maintenance, & Security

## Introduction

### What needs to be addressed?

As greenways increase in communities across Tennessee and the nation, once a greenway is constructed, the emphasis shifts to managing the facility. The Northshore Greenway will have both on road and off-road facilities and while there is a difference between the two types of facilities, the management of both types of facilities is similar.

Management issues include the following components:

- Day to day operations
- Providing security
- Maintaining both the trail/on road facilities and trailheads with parking and a restroom
- Proper, vandal resistant signage

Since the Northshore Greenway facilities will be newly constructed, any major maintenance issues should not appear for 3-5 years. A full list of management and maintenance needs are outlined in the following pages. The list below defines some management areas to be considered:

Operations:

- Trash pickup
- Debris removal from the trail surface including mud, gravel and small limbs
- Tree branch removal
- Mowing grass and leaf removal

Security:

- Defining greenway use policies and insuring they are implemented
- Insuring signage is quickly replaced if vandalized and removal of graffiti in a timely manner
- Daily patrols by police or contract security guards, preferably on bicycles
- Provide greenway user assistance with information and system maps

The following pages provide several different management scenarios of existing greenway systems, both locally and in other municipalities in east Tennessee and provide examples of the different types of managing greenway.

## REGIONAL EXAMPLES OF MULT-JURISDICTIONAL MANAGEMENT PARTNERSHIPS



### Hamilton County Parks and Recreation Department (HCPRD) Tennessee Riverwalk (TR), 10.0 miles and 150 acres of parks

The Hamilton County Parks and Recreation Department has several regional parks across the county and the TN Riverwalk is one of the premier parks. HCPRD manages this portion of the Riverwalk in partnership with the city of Chattanooga. Chattanooga provides funding to Hamilton County and HCPRD operates the TR and uses its own staff and equipment for operations, security and maintenance. The upstream beginning point is the Chickamauga Dam and the downstream end point is the Riverfront park. There are 4 major trailheads along the route that provide parking and restroom facilities as well as other amenities like playgrounds and fishing piers. The TN Riverwalk primary facilities are 10 parking areas, 6 restrooms with drinking fountains and other facilities especially in the downtown Riverfront area.

HCPRD works with the city of Chattanooga and numerous other partners on many of the events and programs that occur along the Riverwalk.

### Knoxville/Knox County

The City of Knoxville has 45 distinct trails totaling 112.5 miles of paved and natural surfaced trails within their parks and recreation department. While there is are separate Knoxville/Knox County parks and recreation departments with their own facilities and programs, there is a high degree of cooperation on greenway development. Both governments have a greenway coordinator and Knox County has a representative on the Knoxville Greenways Commission.

The Legacy Parks Foundation is a major regional non profit foundation which helps facilitate the development of park and greenway projects by acting quicker than local government entities can concerning land acquisition and securing permanent or conservation easements with associated federal tax benefits. In late 2016, the Knoxville created an independent five person greenway crew in the public works department whose sole responsibility is to annually develop two miles of new greenway trail and maintain the other 100+ miles of greenways found in city parks.



### Chattanooga Tennessee Riverwalk Extension (TRE) 3.5 miles

The City of Chattanooga partnered with federal, state and local governments as well as the private sector in the development of the TN Riverwalk Extension which opened in August 2016. The City of Chattanooga manages the TRE through the use of outsourcing to private vendors. There are separate contracts for maintenance, custodial services and the security for the TRE is a portion of a city wide contract. The beginning point for the TRE is the Riverfront park and the end point is in St. Elmo behind the Crust restaurant. This section goes through several industrial areas and is generating private sector funding of housing and other mixed use development.



### Maryville, Alcoa and Blount County (MABC)

The city of Maryville, the city of Alcoa and Blount County have partnered together for the operation of a joint parks and recreation department for over 50 years. This joint commission has its own staff and equipment to perform the operations and maintenance and each government entity contributions to this commission. Development of this joint greenway system started back in the late 1960's with the downtown urban development project which created a small lake with paved trails around it.

The well maintained greenway system includes over 15 miles of paved trails winding through the cities of Alcoa and Maryville. Each government entity funds the development of new greenway sections within their jurisdiction and have combined their planning efforts and recently developed a master plan looking at "missing links" to increase future connections to create a more integrated system.

The MABC entities are also members of the Great Smoky Mountain Regional Greenway Council which is a multi county non profit council working to create a regional greenway system.

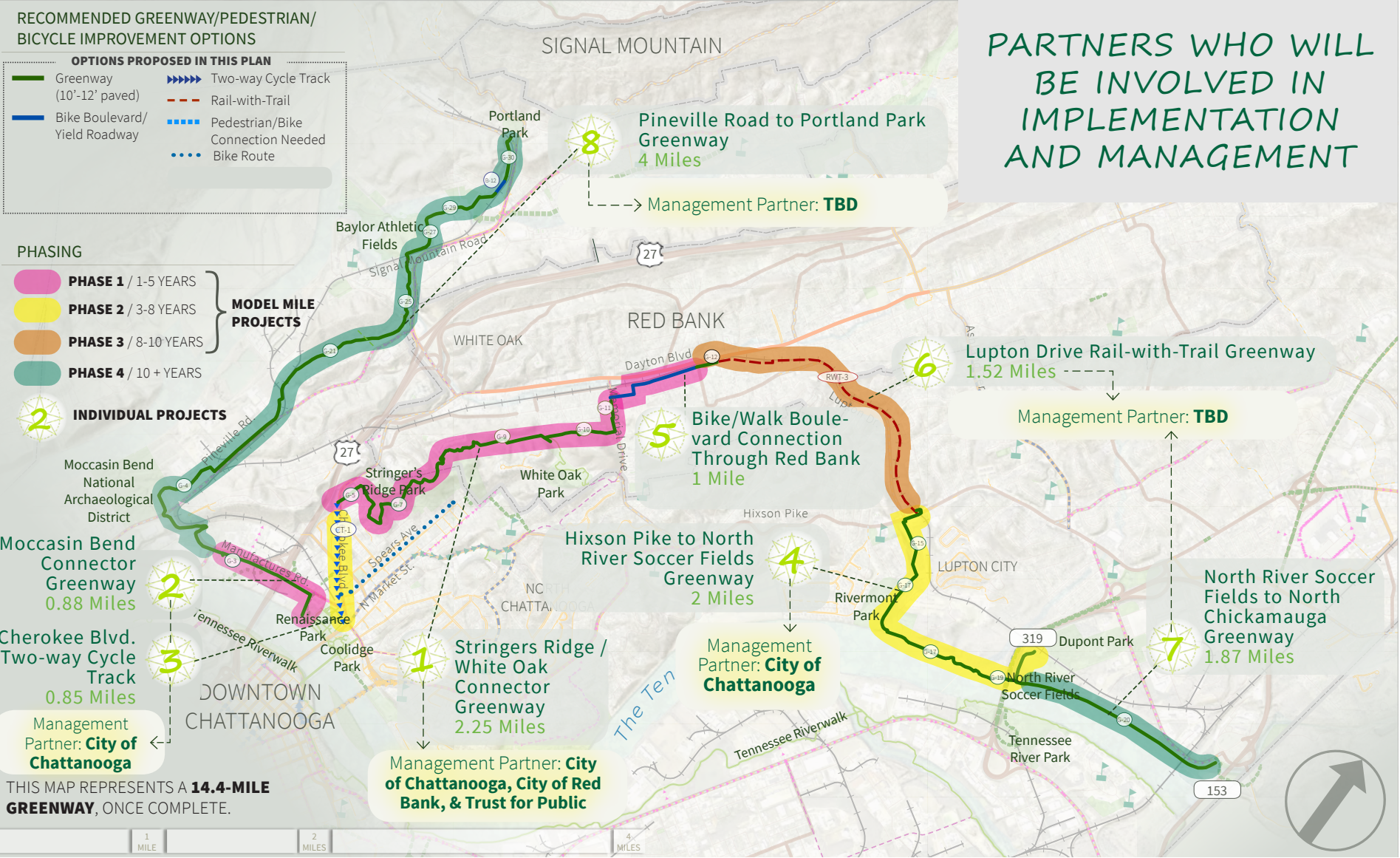


Action Plan

	FURTHER DESIGN AND PLANNING	FUNDING/MAINTENANCE/ MANAGEMENT	PUBLIC/STAKEHOLDER ENGAGEMENT & OUTREACH/ LAND ACQUISITION/LANDOWNER OUTREACH
Corridor Wide	<b>Southeast Tennessee Tourism Association Tourism coordinator:</b> <b>SIGNAGE</b> to help navigate this trail system is critical due to its changing forms. Could put signage on the ground as in Kingsport, TN.	<b>Hamilton County Parks &amp; Recreation:</b> Participation in planning, cooperation with city for entire plan. Advise/input/ feedback on maintenance and management. Partnership in grants and funding. <b>CDOT/Red Bank/Hamilton Co.:</b> CDOT 80-20 or other funding available (3-5yrs.). Advisory board with City of Chattanooga	
PROJECTS 1 & 3*	<b>Chattanooga Department of Public Works:</b> TPO funded*. G-5, G-7 paved and G-9 to G-10 to be compacted gravel. This is easier to construct and a lower cost. CDOT would like to be involved in planning as well as improvements to the Cherokee Boulevard area. <b>City of Red Bank:</b> involvement in implementing greenway until Memorial Dr.	City of Chattanooga to aid in funding.  Seek Recreation Trails Program (RTP) and Health Department Grants.  *Any TPO funds (Surface Transportation Block Grant funds) should be applied for in late 2021, with funds available (as prioritized) in years 2023-2026.	City of Chattanooga aid in outreach.
*Note that unless non-TPO funding can be acquired for these projects, it is likely project 1 & 3 will need to be moved to phase 2, to be built in the 3-8 year timeline.			

**PROJECT 2:** Project is currently underway by the City of Chattanooga. Next step for Manufacturers Road include construction documents. There may be funding to construct. (1-2yrs.)

PROJECT 4	<b>CDOT:</b> Get with TDOT with regards to the CB Robinson Bridge Study (1-2yrs.) <b>Hamilton County Parks &amp; Recreation:</b> Partner on Dupont Park side for trailhead.	Seek Recreation Trails Program (RTP) and Health Department Grants.	<b>Hamilton County Parks &amp; Recreation:</b> Secure easement on Girls Preparatory School property with shared use park. Property is currently being sold.
PROJECT 5	<b>SETDD (Southeast TN Development District):</b> Design, planning, and funding <b>City of Red Bank:</b> Design, planning, and funding <b>Red Bank:</b> Construction, acquisition, and foundation funding. This section is most attainable for quick impact. Low traffic on Lyndon Ave., lane reduction, and stripping on Dayton is feasible depending on the results of the public process. Access is also available via Baxter-Easton Ave.-East Newberry, or acquire rail to E. Newberry. (3-5yrs.)	Any TPO funds (Surface Transportation Block Grant funds) should be applied for in late 2021, with funds available (as prioritized) in years 2023-2026.  Seek Recreation Trails Program (RTP) and Health Department Grants.	<b>Red Bank:</b> Public input and business input regarding corridor study (1-2yrs.)



PARTNERS WHO WILL BE INVOLVED IN IMPLEMENTATION AND MANAGEMENT

Action Plan continued

	FURTHER DESIGN AND PLANNING	FUNDING/MAINTENANCE/ MANAGEMENT	PUBLIC/STAKEHOLDER ENGAGEMENT & OUTREACH/ LAND ACQUISITION/LANDOWNER OUTREACH
PROJECT 6		<b>City of Red Bank:</b> Hopefully cost can be reduced with funding from TDOT and TDEC can be attained for acquisition and construction.	<b>City of Red Bank:</b> Landowner outreach- timing depends on conversations with Norfolk Southern. An alternate route until the railroad can be resolved is Redding Rd. to Ashland Terrace. (6-10yrs.)
<b>PROJECT 7:</b> No actions elected by group.			
<b>NON-MODEL MILE PROEJCTS:</b>			
PROJECT 8	Phase 2 of Moccasin Bend connection could be impetus to complete the North Shore Greenway in this area.		





**SPOT / INCIDENT:**  
Occurs as necessary or warranted.

**REGULAR:**  
Programmed or continuous at  
logical intervals based on features  
and their needs.

**LONG-TERM:**  
Requires major planning, budgeting  
and coordination for anticipated  
investments or major initiatives.

GOVERNMENT ENTITY OR CONTRACTORS	VOLUNTEERS AND/OR NON-PROFITS	GOVERNMENT ENTITY/ TRANSPORTATION DEPARTMENTS, OR CONTRACTORS
<ul style="list-style-type: none"><li>• Citizen Response</li><li>• Low Water Crossing / Warning Signs</li><li>• Major Debris Removal</li><li>• Securing Temporary Signage</li><li>• Identify Detours</li><li>• Information Dissemination</li><li>• Special Events Policies &amp; Permitting</li><li>• Lighting Replacement</li></ul>	<ul style="list-style-type: none"><li>• Citizen Response</li><li>• Spot Improvement &amp; Incident Reporting</li><li>• Water New Vegetation</li><li>• Minor Debris Removal</li><li>• Placing Temporary Signage</li><li>• Information Dissemination</li><li>• Special Event Monitoring /</li></ul>	<ul style="list-style-type: none"><li>• Asphalt Spot Patches</li><li>• Major Debris Removal</li><li>• Graffiti Control</li><li>• Parking Lot Repair</li><li>• Major Debris Removal</li></ul>
<ul style="list-style-type: none"><li>• Scheduling Major Maintenance Tasks</li><li>• Trail Edge / Path Weed Treatment</li><li>• Major Mowing &amp; Trimming</li><li>• Trash Disposal</li><li>• Plant &amp; Trim Trees</li><li>• Stock, Clean Amenities</li><li>• Rotary/Machine Sweeping</li><li>• Bollards / Bollard Locks</li><li>• Sign Replacement</li><li>• Mapping</li><li>• Volunteer Training</li><li>• Accident &amp; Incident Tracking</li><li>• Pest Management</li></ul>	<ul style="list-style-type: none"><li>• Trail Inspection &amp; Condition Surveys</li><li>• Scheduling Minor Maintenance Tasks</li><li>• Minor Mowing &amp; Trimming</li><li>• Removing noxious weeds</li><li>• Trail Shoulder / Borrow Ditch Clean- up</li><li>• Trash Collection</li><li>• Planting Shrubs, Grasses &amp; Flowers; Mulch Planting Beds</li><li>• Locking / Securing Trailheads &amp; Access Points</li><li>• Hand Tool Sweeping</li><li>• Volunteer Training Support</li><li>• Accident &amp; Incident Monitoring</li></ul>	<ul style="list-style-type: none"><li>• Asphalt Crack Sealing / Seal &amp; Cover</li><li>• Shoulder Protection &amp; Maintenance</li><li>• Large Scale Vegetation Removal</li><li>• Dust Management</li><li>• On-Street Sidewalk &amp; Connecting Route Maintenance</li></ul>
<ul style="list-style-type: none"><li>• Fence &amp; Structure Paint / Maintenance</li><li>• Trail Location Signage / Wayfinding</li><li>• Major Amenities Procurement &amp; Replacement</li><li>• Habitat / Environmental Maintenance &amp; Control</li><li>• Secure Funding</li></ul>	<ul style="list-style-type: none"><li>• Benches &amp; Table Paint / Maintenance</li><li>• Support / Pursue Funding</li></ul>	<ul style="list-style-type: none"><li>• Asphalt Seal &amp; Cover / Overlay</li><li>• Centerline Striping / Crosswalk Markings</li><li>• Street Location Signage &amp; Lighting</li><li>• Bridge Inspections &amp; Maintenance</li><li>• Fencing &amp; Railing</li><li>• Drainage / Borrow Ditches, Culverts</li></ul>



*How Often?*  
The following tasks are yearly needs for maintenance of a greenway

*How Much Does it Cost to Maintain a Greenway?*

**\$2K**  
per mile annually

It costs \$2,000 to maintain a mile of a greenway, on average, based on a recent study (*Maintenance Practices & Costs of Rail-Trails*, 2015)

Tasks	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Basic Maintenance												
Inspection & conditions survey												
Graffiti removal	As needed throughout the year											
Hand tool sweeping												
Major mowing & trimming												
Machine Sweeping												
Planting shrubs, grasses & flowers												
Plant, trim trees												
Shoulder / borrow ditch clean-up	As needed or annually											
Trail edge, shoulder, gravel path weed control												
Trash collection & disposal												
Water new vegetation												
Weed control & pest management												
Substantial Maintenance												
Asphalt patching	As needed, fall and spring											
Asphalt crack sealing												
Painting	As needed year around; Every 10 years for major structures & amenities											
Overlay	Once every 20 years											
Shoulder / borrow ditch protection & maintenance												





CHAPTER

10



# Acquisition Options & Tools



# Acquisition Options & Tools

## Overview

In order to avoid challenges later in the greenway development process, strategies for acquisition of land must be considered during the initial planning and throughout the process, including during construction and maintenance of the trail. An understanding of the acquisition strategies and wise use of the funds available for property acquisition adds significantly to the success of a greenway program. Often reaching out early to landowners can help with acquiring donated easements that drastically reduce the overall price of the greenway.

Strategies described in this chapter are intended to outline the most common acquisition tools available via prevailing laws. Recognizing some tools may not be possible or desired at the time of acquisition. The use of some tools may vary based on funding source restrictions, availability of funding and political considerations. Acquisition of property for the development of a greenway is critical and often considered the most difficult element of implementing a greenway program. Alternative routes that avoid those properties that may be difficult to obtain should be identified during the initial planning phase to avoid a greenway being delayed due to the inability to gain access to one property. Attention to the management of a greenway can impact future greenway plans.

Strategies for acquiring property range from the purchase of property at its fair market value to agreements for the use of property encumbered by other easements, such as a sanitary sewer easement, that can be donated due to its reduced value for development. Familiarity with all the acquisition strategies is necessary due to the variety of situations that will confront those charged with the responsibility for acquiring land for greenways. The table, *Land Acquisition Options*, is a quick summary of the benefits and disadvantages of each type of acquisition method. Having a full bag of tools available for use will provide flexibility in dealing with the circumstances associated with every situation.

## Property Owner Involvement

Owners of property on which a greenway trail is proposed are key stakeholders. Some of them have been identified as part of Phase 1 including Norfolk Southern Railroad, Baylor School, and owners of a development going in on the east-side of the study area. Once it is decided that outreach to property owners is needed, consider sending out letters or connecting one-on-one to some of the key property owners, for the following reasons:

- It makes the property owner a part of the planning process, potentially initiating a relationship between the property owner and the greenway program.
- This relationship leads to better communication, enabling the property owner to stay informed of progress and enabling the property owner to let greenway

- program staff know of the owner’s plans for the property.
- In some cases, the property owner may be able to incorporate the planned greenway into the plans for the use of the property, thereby bringing advantages to both the greenway program and the property.

Awareness of greenway plans may result in the property owner informing the greenway program of any plans to sell the property, providing an opportunity for purchase of the required land before the property changes hands. In some cases, the property owner may be willing to provide property for a greenway after seeing progress on other segments or seeing the use of greenways by friends and neighbors. If the property owner adamantly refuses to consider the location of a proposed greenway on the property, alternate routes can be considered as the preferred route.

Communication with property owners can provide valuable insight into which of the acquisition strategies identified o the right are best suited for the acquisition of a particular property.



One-on-one landowner engagement during the feasibility phase and especially the preliminary engineering phase will help to determine the most feasible route and get the landowner “on-board”

## Land Acquisition Options

Land Acquisition Method	Range of Uses	Time to Complete	Complexity	Legal Exposure	Expense
1. Fee Simple Acquisition	●	○	●	●	○
2. Acquisition by Non-Profit Foundation	●	○	○	○	●
3. Negotiated Sale	●	○	○	●	○
4. Bargain Sale	●	●	○	●	○
5. Option/First Right of Refusal	●	○	○	○	○
6. Easement Purchase	○	○	○	○	●
7. Shared Easement	○	○	○	○	●
8. Donation	●	○	●	○	●
9. Required Dedication of Property or Easements	●/○	●	●	○	●
10. Eminent Domain of Property or Easements*	●/○	○	○	○	○

Key: ○=Poor / Difficult; ○=Moderate; ●=Good / Favorable

## Methods of Acquisition

The purchase of property required for a greenway is the most direct and effective way to obtain the land needed for greenway development. Prior to undertaking the purchase of property, an understanding of the various options for property purchase and the availability of funds to consummate the purchase are necessary. An overview of the most common methods of purchasing property for greenway development is provided below.

**1. Fee Simple Acquisition.** Possibly the least complicated, but often the most expensive method for acquiring property for a greenway is the fee simple acquisition (purchase) of the property. In this method the greenway program purchases the title, with all rights, to the property at the fair market value. The first step in determining the fair market value of the property is identification of the property required for the greenway. Due to the linear nature of greenways, typically only a portion of the owner’s property is required. Thus, a survey of the route determines the amount of owner’s property required, indicates the boundaries and the



acreage of the property being purchased, and is used to determine the value of the property via an appraisal. Because greenways are often located adjacent to rivers, streams, ponds or lakes the land may be valued higher than property not fronting a water feature. It may also be unbuildable due to flood plain restrictions (as is the case for areas along Mountain Creek).

In addition to the cost of the property, other costs associated with purchasing property may include a survey, appraisal, negotiated relocation costs and closing costs. When the acquisition is complete the property is owned outright by the greenway program sponsor, an arrangement that provides the broadest possible legal range of allowable activities on the property, but the new owner also incurs full liability and maintenance responsibilities. Although an important strategy and one that must be considered, the non-recoverable costs associated with fee simple acquisition of property make this an expensive option. Reserving the use of fee simple purchase for key parcels and for properties that cannot be acquired in any other way will extend the limited funds available to most greenway programs.

**2. Acquisition by Non-Profit Foundation.** Utilizing The Trust for Public Land, which has been a leader in working to implement the Chattanooga Greenways Master Plan, is critical. Their role as a negotiator for easements is key as they are tax-exempt, which is critical to the success of greenways receiving donated easements. Donations and contributions to the foundations typically can be deducted from the taxes of those persons who contribute, which make them more successful in raising funds than a government entity. In addition, some funding sources will provide funds to foundations but will not provide them to local governments.

Donations of land made to foundations also are tax-exempt, making the foundations more successful in negotiating the purchase of properties. The flexibility of foundations in negotiating the purchase of property is heightened by the fact that they are not bound to the same limitations as local governments. Also, some property owners are more comfortable in negotiating with a foundation than with a government agency.

**3. Negotiated Sale.** Under this option the price for the property is negotiated and an agreement is reached to purchase at a price below the fair market value. Numerous factors come into play during this process, with the key one being that the property owner must be willing to negotiate. An understanding on the part of the property owner that the property needed for the greenway is worth less than the balance of the owner's property and/or the greenway brings certain benefits to the balance of the property may motivate the property owner to negotiate. Factors to consider in a negotiated sale include :

- Property adjacent to a river or creek is often designated as a flood hazard area, which limits its development potential and could prohibit development of the property. Due to these limitations on development the property value is often lessened. Often times creeks and streams have buffers required by local agencies, also barring opportunities for development.
- It has been shown that the construction of greenways increases the value of properties located adjacent to the greenways. An argument can be made that since the construction of a greenway will increase the value of the adjacent property, the price of the property on which the greenway will be constructed should be reduced in acknowledgment of the increase in value the greenway will bring to the adjacent property. Many developments that are planned or underway

during the planning of greenways have provided land required for greenways at a reduced cost in acknowledgment of the value the greenway brings. Negotiating with a property owner requires patience, an understanding of the real estate market, a love of greenways, and a knowledge of the financial implications of providing land at a negotiated price. Possession of the skills and time required to negotiate the sale of a property is key to the success of this approach.

**4. Bargain Sale.** In this case, the asking price of a property is reduced in response to some characteristic of the property that is perceived as affecting the value of the property. The factors that may result in a property being offered at a bargain price are varied, and could include:

- Need of the owner(s) to obtain funds quickly;
- Burdening of the property with challenges such as the need for an environmental clean-up, which the owners do not want to undertake;
- Limited development potential of the property due to its size, access, etc.; or
- Tax advantage to the owner.

Opportunities for a bargain sale are infrequent and the agency charged with the responsibility for acquiring property for the development of greenways should be prepared to act on these opportunities when they become available. The identification of properties required for greenway development during the initial greenway planning efforts and continued contact with the property owners are essential to knowing when properties may be available through a bargain sale. Having the flexibility to acquire properties when they are available and hold them for greenway construction at a later date are key to being able to take advantage of these opportunities. That flexibility requires the ability to raise capital, maintain a reserve fund or obtain credit quickly to make an acquisition.

**5. Option/First Right of Refusal.** In some cases, the property owner may not wish to sell the property required for greenway development at a time most optimum of securing easements. The owner may, however, be willing to consider the sale of the property at a future date. In these situations, the alternative of an option to purchase the property at some future date or a first right of refusal should be considered. Although similar, these two methods have differences that make them unique.

**Option to Purchase.** An option for the purchase of a property acknowledges that the owner (optioner) will sell the property to the greenway program (optionee) at some agreed upon time or upon the completion of an identified action. A formal and legally binding agreement establishes all the parameters for the option and identifies the time when the option will be exercised, at which time the purchase will be completed. At the time of the signing of the option agreement the optionee provides a monetary payment, which is held in a trust account, payable to the optioner. This payment is a demonstration of the commitment of the optionee to purchase the property and its acceptance by the optioner is a demonstration of their commitment to sell the property at the price and time stated in the agreement. The payment typically is credited toward the purchase price of the property.

**First Right of Refusal.** A first right of refusal is an agreement entered into between the prospective purchaser of the property and the prospective seller. This agreement differs from an option in that it does not commit the owner to sell the property nor does it commit the greenway program to purchase it. In its most basic form, a first right of refusal is an agreement whereby the owner commits to make the potential purchaser aware that the property will be sold and provide the potential purchaser with the right to purchase the property before it is made available to others. Upon notification of the plans to sell the identified property, the potential purchaser makes a decision whether to enter into a contract for the purchase of the property. The agreement may or may not include the exchange of money or other considerations and may or may not have a time limit assigned to it.

**6. Easement Purchase.** Law defines easement as an interest in land owned by another that entitles its holder to a specified limited use or enjoyment, such as the right to cross the land or locate facilities on it. An easement provides the right to use the land of another for a specified purpose, as distinguished from the right to possess that land. An easement agreement permits the use of a property for a specific purpose. The acquisition of an easement to locate, construct, and maintain a greenway should be explored in an effort to reduce the cost of obtaining property. Rather than acquiring all the rights to a property, with the ability to use the property for any legal purpose, the acquisition of an easement limits the use of the property. The value of an easement typically is significantly less than the fee simple value of the property in recognition of the limits on the use of the property imposed by the easement agreement.



Norfolk Southern Railroad  
has indicated in initial  
conversations they would  
consider divesting in  
“excess ROW” and would  
sale this ROW as a fee  
simple acquisition (at fair  
market value cost).



Easements obtained for greenways are considered express easements, as the terms are set forth in a written agreement. The easement agreement entered into for a greenway should specify adequate room for the construction and maintenance of the greenway. The agreement may specify an easement of a certain width to permit the greenway’s construction, with a lesser width identified for the greenway’s permanent easement. The agreement may also establish a time period within which construction must be initiated.

In addition to the usual provisions addressing the right to construct and maintain a greenway, an easement agreement often addresses the rights and responsibilities of the grantor and the grantee. The grantor may retain the right to pass over the easement, to locate certain utilities within or across the easement, or to use the amount of acreage located within the easement for the purposes of calculating the density of development permitted by land development ordinances applicable to the property on which the easement is located. The grantee may be charged with certain responsibilities, such as maintaining the greenway and keeping it free of debris and litter, along with the right to use the easement for a greenway. Standards for hours of use, lighting, signage, fencing and other provisions addressing greenway design, construction, and use may be established by an easement.

**7. Shared Easements.** Land on which a greenway route is proposed is sometimes encumbered by an existing easement, most commonly for the location of utilities. During the planning of a greenway, all utility easements located within the trail corridor should be explored for the feasibility of locating the greenway within the existing utility easements.

Sanitary sewer easements are the easements most commonly shared by greenways, but any easement that permits the location of a trail could be the potential location of a greenway. Because the use of the property is limited by an existing easement, it may be easier and less expensive to obtain an additional easement for the greenway. Due to the specificity of easement agreements in identifying the use of an easement and limiting the use of the easement to that identified in the agreement, an additional easement will have to be obtained for the location of the greenway.

Negotiations with the property owner will be necessary to obtain the additional easement required for the greenway. The holder of the existing easement will also have to be involved in the negotiations, as their use of the easement may necessitate certain standards or restrictions on the use of the property encumbered by the easement.

Discussions with utility providers and others who hold significant easements within the greenway planning area should be undertaken early in the planning process in an effort to obtain a general agreement for the shared use of their easements. A general agreement would provide the assurance that the easement could be used, provided the property owner permits an additional use, and establishes the standards and conditions that must be met for the shared use of the easement.

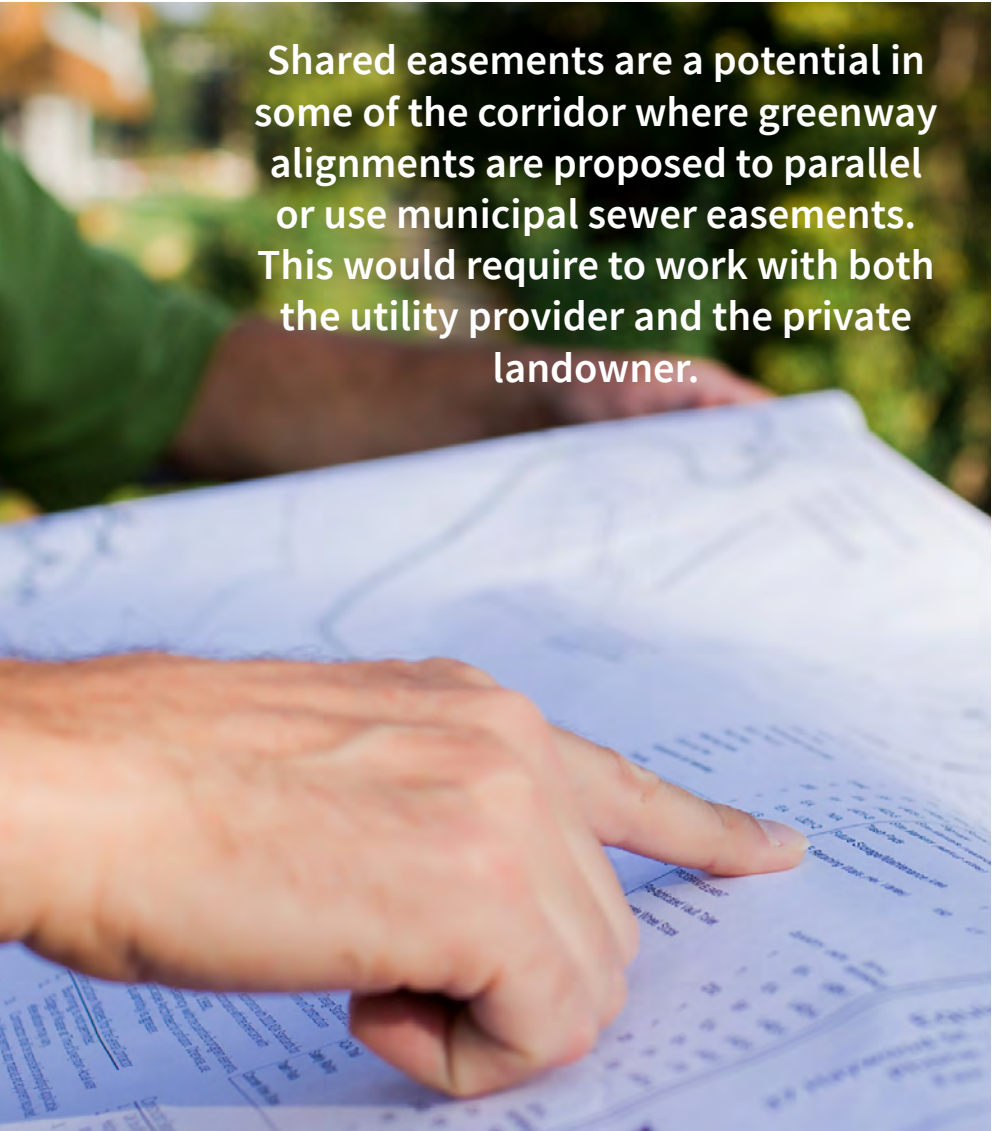
Cooperation during the initial negotiations for obtaining easements can save all involved time and money.

Rather than having to negotiate separately with the property owner for the two easements (one to permit the placement of utilities and another to permit greenway construction), the complete easement package can be presented at one time. The personnel costs incurred in identifying and negotiating the needed easements and the legal costs incurred in preparing and recording the easements can be shared rather than duplicated. The property owner and the entities sharing the easement have a better understanding of their rights and responsibilities. This approach is better suited for developing areas where utility infrastructure is being planned and/or installed.

Communication with all utility providers should be initiated in an effort to identify plans for infrastructure improvements and extensions. Opportunities for sharing easements, and the costs incurred in obtaining these easements, should be pursued. Agreements, whether written or verbal, to work together to provide a complete infrastructure system that includes utilities and greenways, should be reached with all utility providers.

**8. Donation of Property.** The purchase of property or easements for greenways may be the only option in some cases, but other less expensive options should be explored first in an effort to extend the limited funds available for greenway development. Efforts to obtain donation of easements and/or property for greenways should be given high priority. While the costs of negotiating the donation and the potential legal fees involved are incurred in this approach, significant property costs are avoided.

As stated, contact with property owners early in the greenway planning effort is important in efforts to obtain property/easement donations. Concerns that the property owner may have regarding the construction and/or use of the greenway should be addressed completely. The ability to receive favorable tax benefits as a result of the donation of the easement and/or property may be the deciding factor in an owner deciding whether or not to make a donation.



**Shared easements are a potential in some of the corridor where greenway alignments are proposed to parallel or use municipal sewer easements. This would require to work with both the utility provider and the private landowner.**



**Many developments that are planned or underway during the planning of greenways have provided land required for greenways at a reduced cost in acknowledgment of the value the greenway brings.**

**A local example in Chattanooga of a greenway being built as part of a development is Cameron Harbor Village, where the City worked with the developers in the early planning stages.**

Photo courtesy of Cameron Harbor Village



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CHAPTER

11

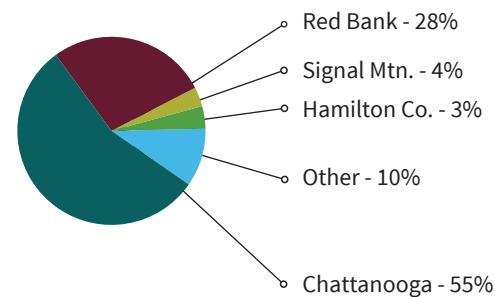
Public Survey



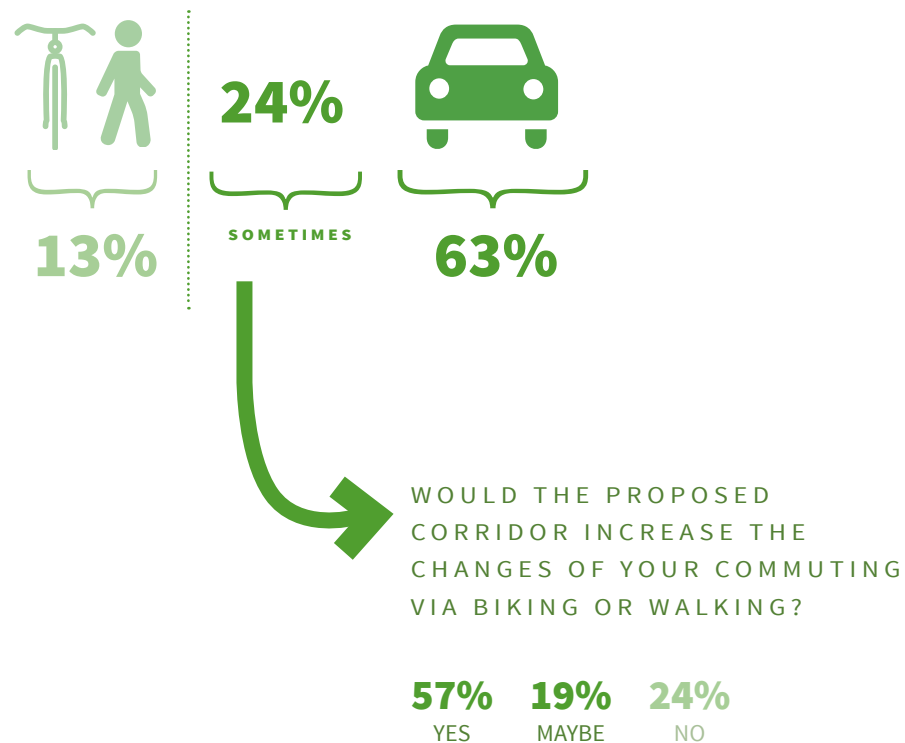
# Public Feedback

In collaboration with local partners, a digital public survey was developed and distributed to the public by the design team. The feedback was tremendous! Over 500 surveys were completed - the public had lots to say about the North Shore Greenway Study. The information has been collated into the following infographic:

## 1 WHERE DO RESPONDENTS LIVE?

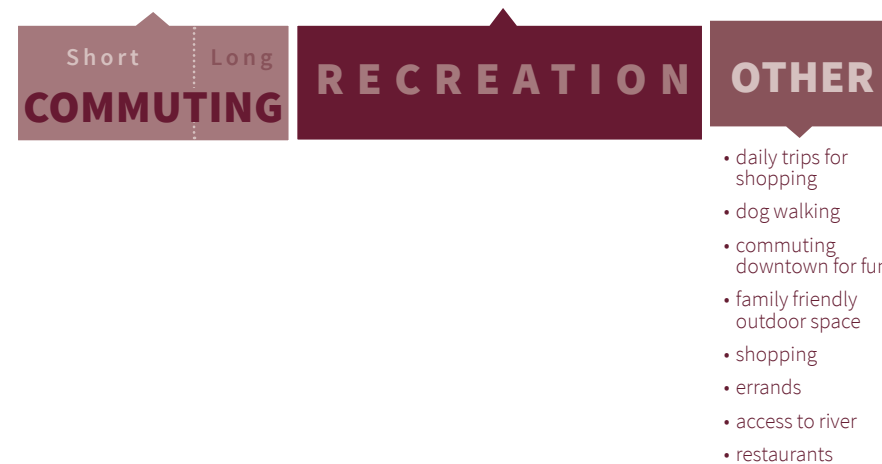


## 2 DO YOU CURRENTLY COMMUTE VIA BIKING OR WALKING?



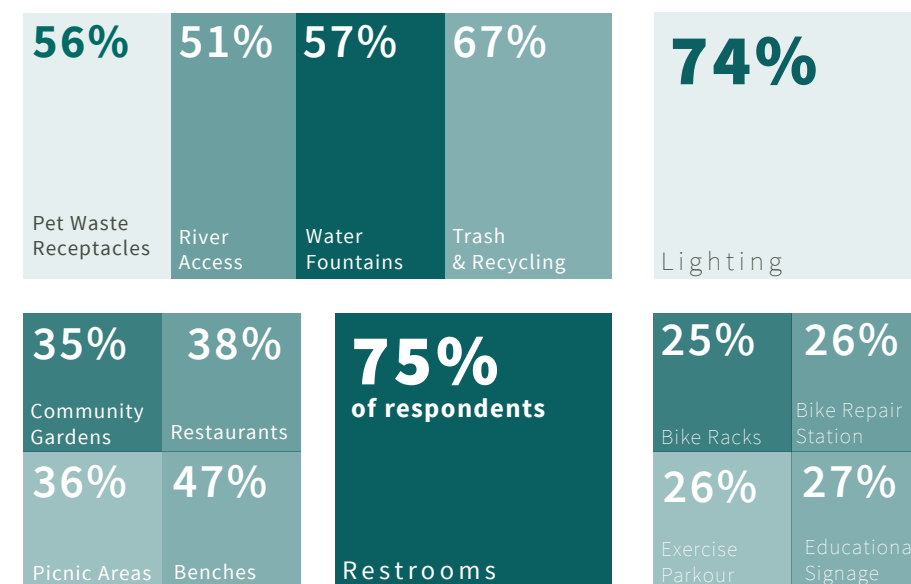
### 3 HOW WOULD YOU USE THE CORRIDOR?

of **533** responses *Commuting & Recreation* were the top 2 uses



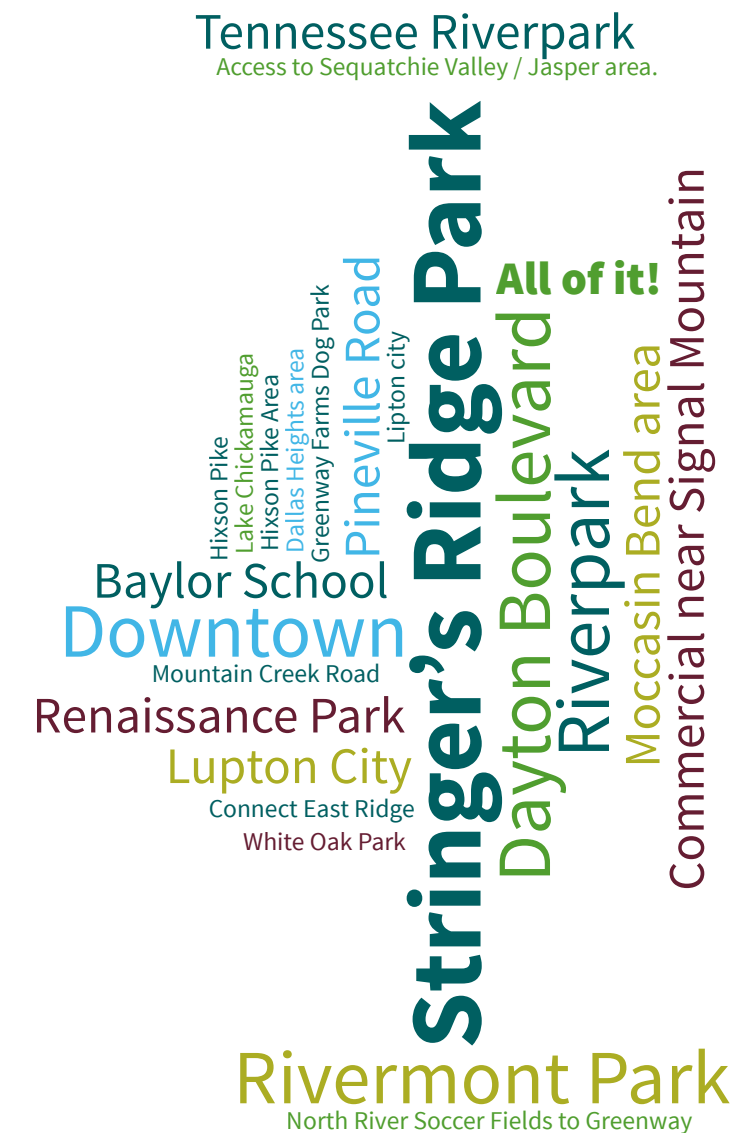
#### 4 DESIRED AMENITIES

PARTICIPANTS HAD THE OPTION TO SELECT ONE OR MORE



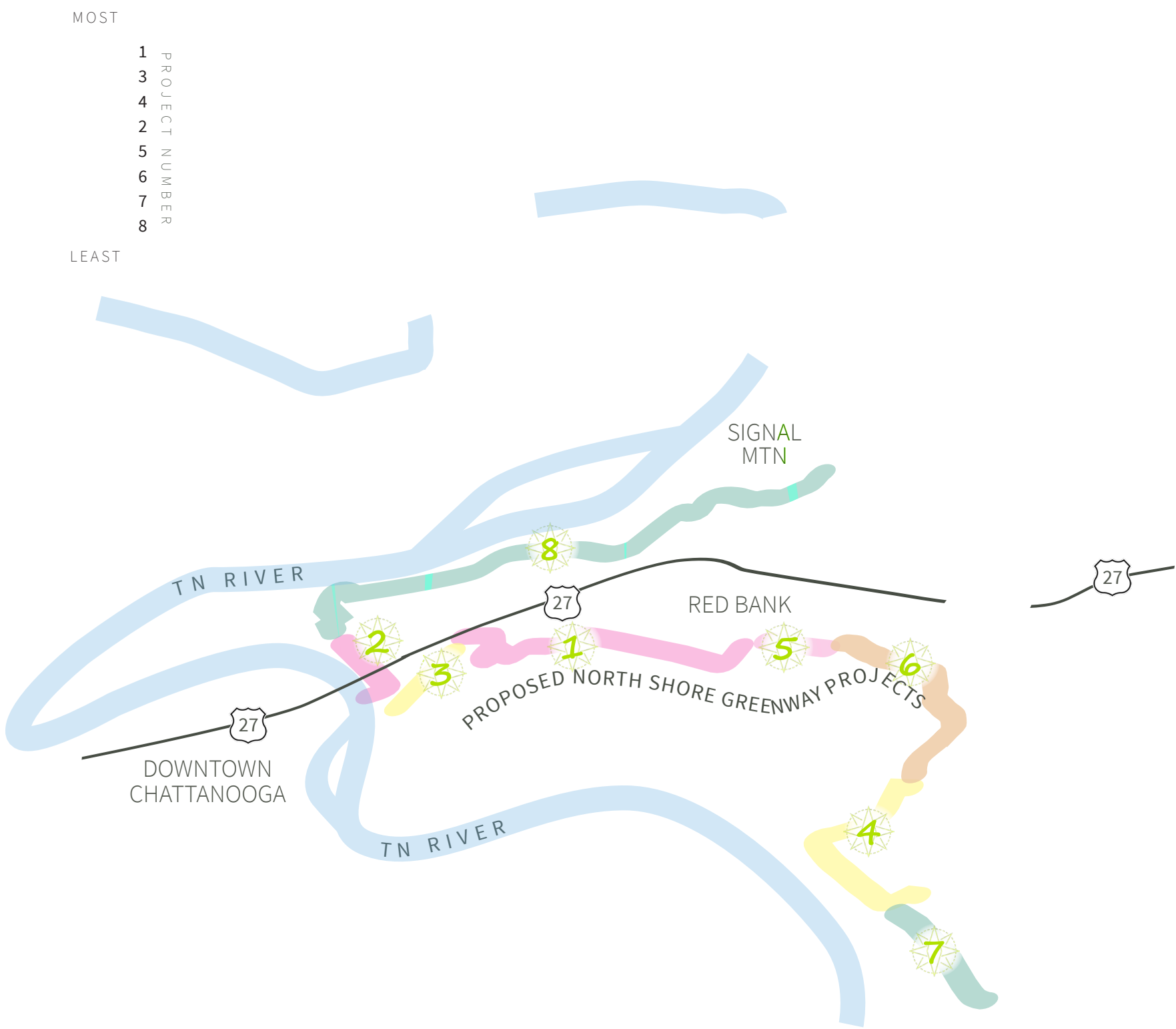
## 5 WHAT AREAS ARE YOU MOST LIKELY TO RIDE OR WALK TO IF THE PLAN IS IMPLEMENTED?

(SIZE OF TEXT REPRESENTS THE NUMBER OF RESPONSES FOR A GIVEN AREA)

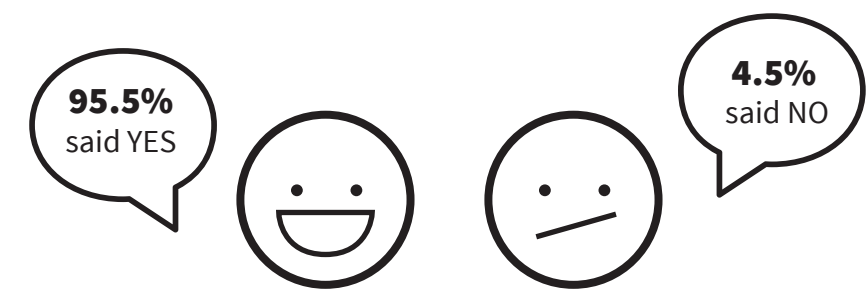




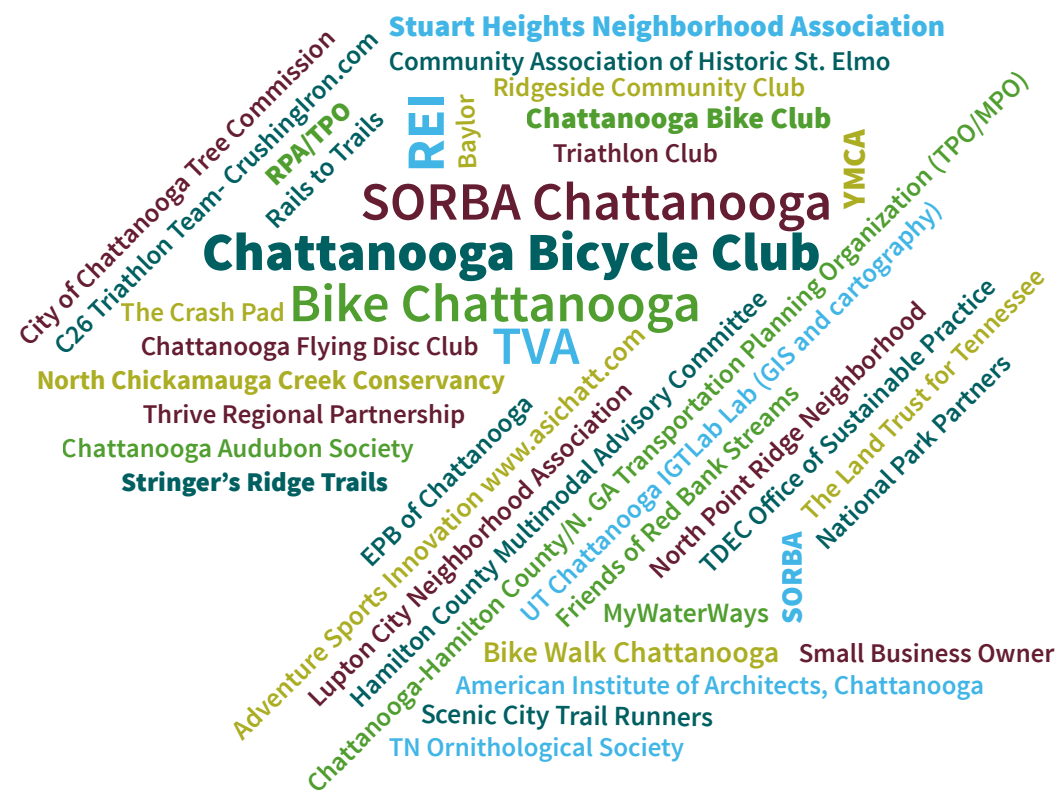
6 PROJECTS PEOPLE ARE MOST EXCITED ABOUT:



7 SUPPORT GOVERNMENT INVESTMENT



8 POTENTIAL PARTNERS/ PROGRAMS  
(SIZE OF TEXT REPRESENTS THE NUMBER OF RESPONSES BY THOSE WHO SAID AN ORGANIZATION THEY ARE INVOLVED WITH MAY BE WILLING TO PARTNER):



9 ADDITIONAL COMMENTS & CONCERNS  
(SEE APPENDIX D)





## APPENDIX A

## Landowner Engagement



MEMORANDUM

March 6, 2018

FROM: Terry D. Reynolds, A.I.C.P.  
TO: Kimberly M. Williams, Equinox Environmental  
RE: North Shore Greenway meeting with Baylor School

On Monday, March 5, 2018 I met with Lyndhurst Foundation President Benic M. “Bruz” Clark and Baylor School Headmaster Scott Wilson, Baylor Facilities Director Don Curtis and Baylor CFO Dallas Joseph (on speakerphone) regarding the potential for an interface between the proposed North Shore Greenway (NSG) and the Baylor School campus.

Below are my notes of that meeting:

1. Bruz and Terry discussed the nature and extent of the NSG corridor study:
  - A. The Introduction from the RFQ (copied to the attendees beforehand) was referenced
  - B. The NSRR (Chattanooga Traction Company) right-of-way corridors from the North Shore area to Portland Park (as well as to Lupton City and the North Chickamauga Creek Greenway via Red Bank) was reviewed on project mapping (particularly the context map); and the official NSRR position regarding Rails-with-Trails was discussed
2. The situation of the Baylor School campus and other Baylor properties along that corridor was also reviewed on project mapping, particularly early orientation sheet 7 and sheet 8:
  - A. The proposed NSG alignment approaches the from the south along Pineville Road
  - B. The proposed North Shore Greenway alignment continues north at the Walmart parking lot, along the Mountain Creek floodway to property owned by the City of Chattanooga, then on to Signal Hills Drive and further northwest toward Portland Park
  - C. Bruz pointed out the Campus (and other Baylor properties) in the context of the NSRR (Chattanooga Traction Company) rail corridor and the NSG agenda, etc.
  - D. Scott mentioned that NSRR trains pass through the Campus a couple of times daily
3. There was much discussion of the Baylor School perspective relative to the proposed NSG, the NSRR right-of-way and potential parallel and other alignments and the particular areas of greater sensitivity vs. other areas of more flexibility:
  - A. Don suggested that among primary concerns of Baylor School are security and safety:
    - 1) when the TN Aquarium Conservation Institute came to the Campus, it helped to know that it would be a somewhat limited and controlled-access facility (not to be generally open to the public without invitation, etc.)
    - 2) the Baylor School leadership and Board would need to carefully evaluate any sort of prospect for a public biking and walking corridor intruding into the core campus area regarding any potential for impact on student and faculty safety and security and general campus access control issues, etc.
  - B. Dallas added that Baylor School concerns were foremost in their consideration of this:
    - 1) traffic is also a major concern, since sometimes it may seem as if the Campus never sleeps: events take place at all hours of any given day of the week
    - 2) at “peak times”, vehicular traffic can be dangerous at best, especially considering that a rail corridor passes through the campus

- 3) introducing additional public bicycle and pedestrian activity into that mix may push the administration concerns over the limit
- 4) specific spots of potential conflict would need to be identified and addressed from the Baylor School perspective before further consideration can proceed
- C. Terry addressed the larger context:
  - 1) any property owner whose land is impacted by this proposed alignment is obligated to consider their own interests first (and hopefully see the NSG as an asset / amenity)
  - 2) NSRR, for example, looks at the proposed NSG primarily in terms of its potential for conflicts with their business mission
  - 3) it is hoped that Baylor School will be able to see the NSG as an asset to the campus, but it is also understood that this would only be possible if it is done in such a way that all of the Baylor School concerns are adequately addressed
  - 4) when asked about other alternative alignments considered, additional conceptual plan alignments were reviewed as marked up on project maps and plans
  - 5) among other routes, a potential overland alignment was discussed along the Baylor School property line with the Windridge Apartments and between Robbins & Bohr and Signal Mountain Road: while there was support for the idea of staying out of the core campus area (and that access control could better be provided along the perimeter Baylor School boundary); but there were still concerns expressed about crossing the main entry / exit point of Baylor School at Signal Mountain Road despite the fact that it is a signalized intersection
  - 6) also raised was the prospect of crossing Mountain Creek on the Raider Lane bridge (with understandable concerns about encroachment within a currently-gated area)
4. Other comments:
  - A. Bruz suggested that there should be a way for this to be considered as an amenity to the Baylor School campus if a way can be found to make it attractive without any drawbacks
  - B. Dallas observed that despite all of the extra effort that has been expended to-date, the signalized intersection of the Baylor School entry / exit driveway at Signal Mountain Road continues to be very dangerous
  - C. Don mentioned the fact that Baylor had been offered \$1 million for the property between (new) Pineville Road and the new Baylor School entry / exit point, but had turned it down as inappropriate: similarly, it would not want to do anything that would diminish the asset value of its front door frontage
  - D. Scott added that it may be worth considering that if the NSG entered the Baylor School campus via Hudson Road on the TN Aquarium Conservation Institute driveway, it could be possible to cross over the NSRR right-of-way and follow (old) Baylor School Road as a yield roadway to the cul-de-sac, emerging onto Signal Mountain Road at the Stringers Ridge culvert and that such a route may be better than a crossing at the traffic signal
  - E. Bruz also raised the prospect of what would happen if NSRR were to abandon the right-of-way in the future?
5. Before the meeting ended, all wanted to determine how this discussion should proceed:
  - A. Baylor School already has a campus master plan which is continually updated and will need to be compared to what is shown in the NSG plans
  - B. The Baylor School administration will need to review the documents provided (maps and plans, etc.) and then schedule a meeting with the Facilities Committee when appropriate
  - C. It is likely that the Facilities Committee will explore additional alternative alignments in order to identify one that optimizes the enhancement of the campus as well as minimizes adverse impacts
  - D. When the Facilities Committee has a recommendation, this issue may be brought before the Baylor School Board of Directors who will craft a response of some sort
  - E. Terry and Bruz expressed appreciation at the level of consideration the NSG was being given at these highest levels of the Baylor School administration





5.4 Parallel Roads/Facilities

In situations where a roadway, retaining wall, or highway facility are being modified or constructed adjacent to Norfolk Southern Railroad, the Sponsor shall engage NS to ensure the project will not adversely impact the railroad. The design of highways, highway intersection, and crossings are the responsibility of the Sponsor. Where possible, parallel public roads should be located off NS property. Parallel roads involving a crossing, either existing or proposed, shall be aligned to allow sufficient distance for the largest permitted vehicle utilizing the road to safely stop between the parallel road and the railroad control signs, markings or warning devices.

Roadway runoff drainage adjacent to railroad property must be designed to drain away from the railroad and prevent standing water and potential erosion. Access for NS equipment to the railroad right-of-way, structures, and track shall not be restricted or prevented. In addition to NS guidelines, Federal and State design manuals, the Manual of Uniform Traffic Control Devices (MUTCD) and the American Railway Engineering and Maintenance of Way Association manuals (AREMA) provide design information to be considered by the highway agency responsible for the project design. The appendix to this document lists additional information on the MUTCD and AREMA manuals.

- At the PE level, submission of the 30%, 60%, ROW, and 100% plan packages should be provided to NS for review and approval.
- Care shall be made to locate all parallel public roads/facilities off the NS property where possible.
- Drainage for both the public road and NS shall be considered. Adverse impacts to the NS property resulting from insufficient drainage devices and E&S controls will not be permitted.
- Access to the NS right of way for its employees and agents shall not be restricted by the proposed facilities.

5.5 Bicycle/Pedestrian Trails and Crossings

NS policy does not allow pathways that would permit pedestrian, bicycle, and other recreational traffic to move parallel to trains on NS right-of-way or to cross at grade.

NS recognizes that communities often wish to establish recreational paths in areas adjacent to active railroads. These paths are of great value to local communities, and while NS will cooperate in the establishment of these paths, it is critical to recognize that important

requirements must be met and safety precautions taken to protect the public and NS employees.

In rare circumstances where a path and NS rail lines parallel each other, safety measures such as signage and fencing will be required. Installation and future maintenance costs of these signs are the responsibility of the trail sponsor or agency and are essential to the safety of those using the railroad and the path.

At-grade trail crossings will not be allowed by NS, but trails can be allowed under or over the tracks provided appropriate safety measures are provided and that the project follows the previously described preliminary engineering review and construction monitoring processes. When a pathway occurs at an established highway-rail at-grade crossing, it will be considered provided it is within the highway easement across NS right-of-way and appropriately signed and protected. The cost of signs, crossings and warning systems will be paid by the project sponsor or agency.

- At the PE level, submission of the Concept, 30%, 60%, ROW, and 100% plan packages should be provided to NS for review and approval.
- Proposed Structures over NS shall satisfy the requirements set forth in the Special Provisions and Overhead Bridge (OHB) Design Criteria. This includes horizontal and vertical clearances, protective fence requirements, drainage requirements, etc.
- Sponsor developed plans shall consider the constructability of the proposed OHB. This includes site access, crane and equipment requirements, girder splice locations, support tower requirements, overhead and undergrade utilities, as well as type of NS facility, number of tracks, and number of daily train movements.
- Parallel bicycle and pedestrian trails shall be located off the NS property.
- Protective fence and appropriate signage may be required at the discretion of NS. Fencing may need to be provided on structure and/or adjacent to the trail or path.

5.6 Painting Overhead Bridges

Cleaning and painting bridges over NS right-of-way requires an agreement with NS to ensure no impact will be incurred by the railroad and that all applicable safety regulations are followed. A Preliminary Engineering agreement may be required to cover NS's review of the project and to prepare a cost estimate and construction



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**APPENDIX**  
**B** *Potential Easements Required*



# RECOMMENDED GREENWAY/PEDESTRIAN/ BICYCLE IMPROVEMENT OPTIONS

OPTIONS PROPOSED IN THIS PLAN			

Note: A rail-trail is possible if the Norfolk Southern Railroad ROW goes up for sale. This has not been displayed in these options.

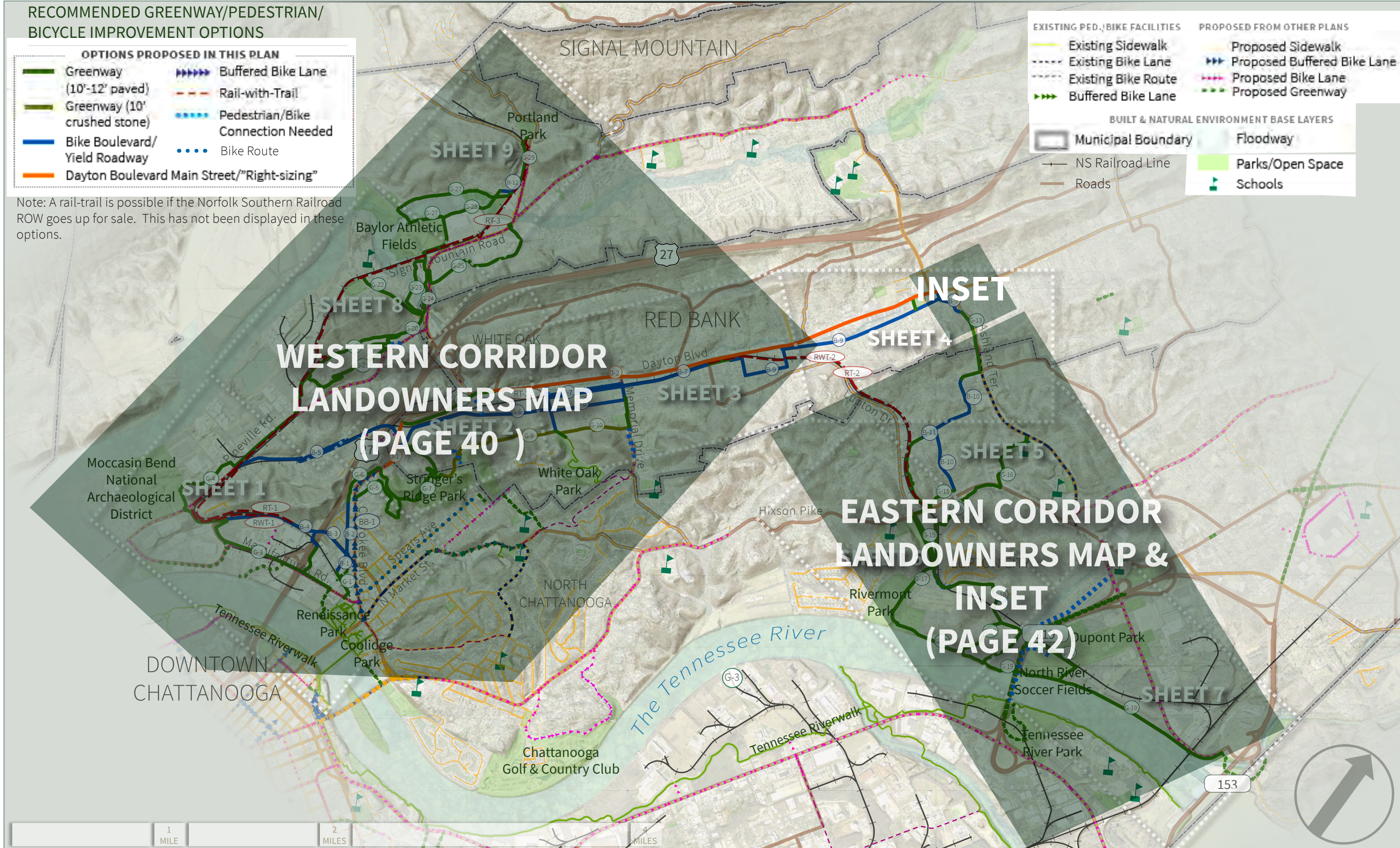
EXISTING PED./BIKE FACILITIES		PROPOSED FROM OTHER PLANS	

BUILT & NATURAL ENVIRONMENT BASE LAYERS	

## WESTERN CORRIDOR LANDOWNERS MAP (PAGE 40)

## EASTERN CORRIDOR LANDOWNERS MAP & INSET (PAGE 42)



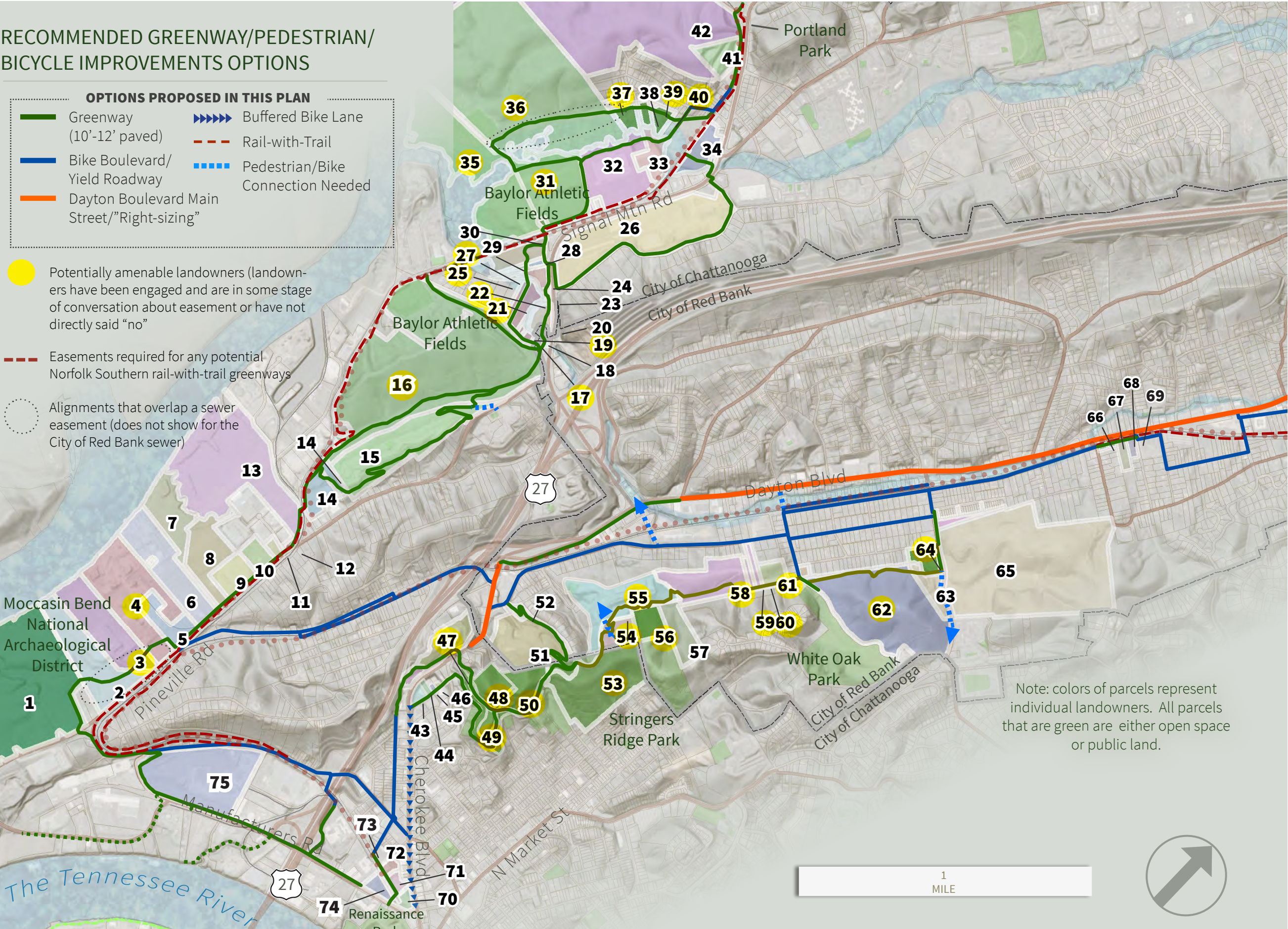


RECOMMENDED GREENWAY/PEDESTRIAN/  
BICYCLE IMPROVEMENTS OPTIONS

**OPTIONS PROPOSED IN THIS PLAN**

Greenway (10'-12' paved)	Buffered Bike Lane
Bike Boulevard/ Yield Roadway	Rail-with-Trail
Dayton Boulevard Main Street/"Right-sizing"	Pedestrian/Bike Connection Needed

- Potentially amenable landowners (landowners have been engaged and are in some stage of conversation about easement or have not directly said "no")
- Easements required for any potential Norfolk Southern rail-with-trail greenways
- Alignments that overlap a sewer easement (does not show for the City of Red Bank sewer)

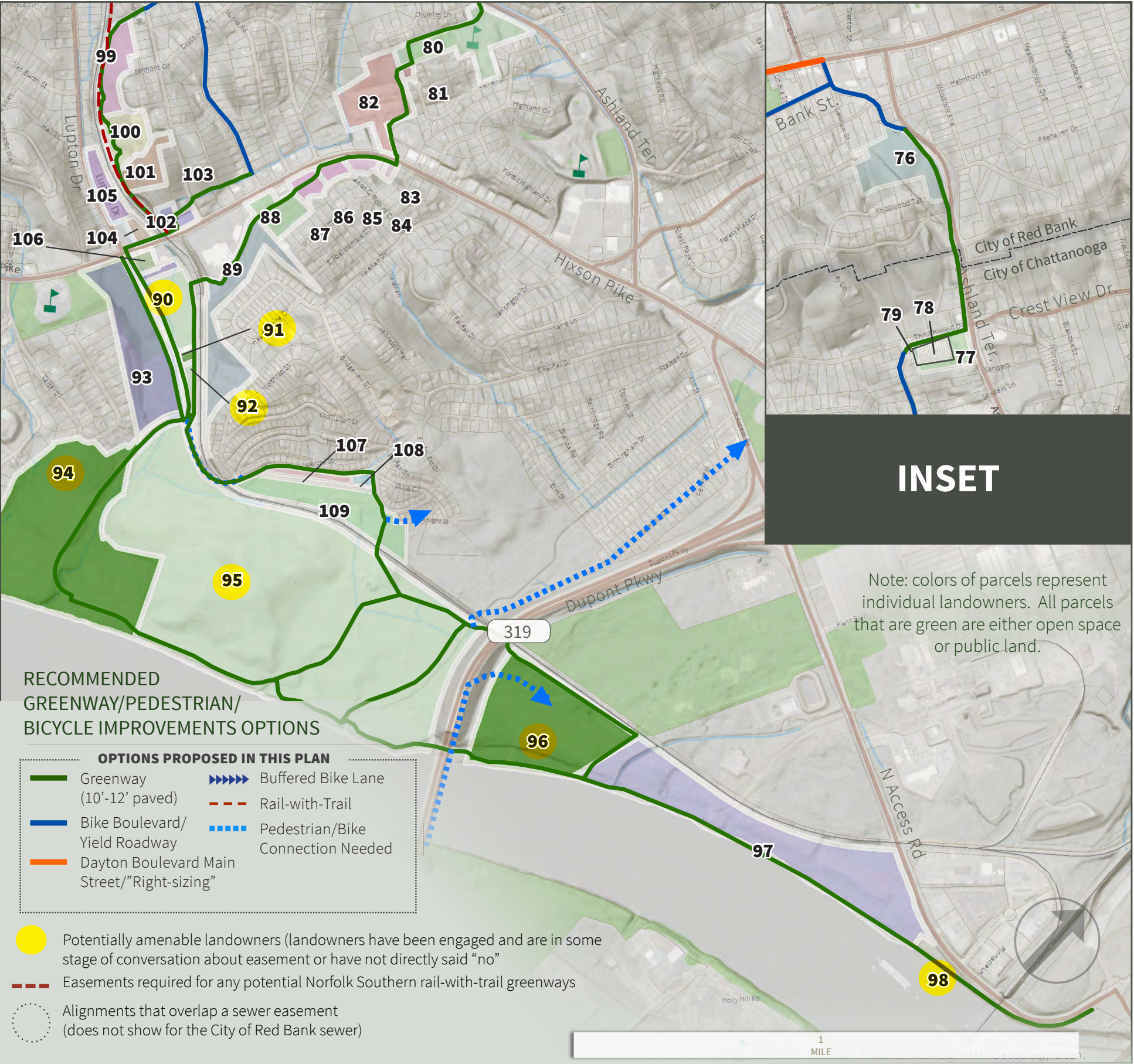




Map ID #	Owner	Land Use	PIN
1	UNITED STATES OF AMERICA-NATIONAL PARK SERVICE	Industrial	135 014
2	ELECTRIC POWER BOARD OF CHATT	Industrial	135 011.01
3	TENN VALLEY AUTHORITY	Industrial	135 011
4	RIVERSIDE INDUSTRIES LLC	Industrial	135 010
5	GEO SPECIALTY CHEMICALS INC	Industrial	135 010.01
6	BRIGHT STAR ENERGY INC	Industrial	135 009
7	SERODINO INC	Industrial	135 009.02
8	RADIO CHATT INC	Industrial	135 008
9	BRADY REAL ESTATE HOLDINGS LLC	Industrial	135 007
10	COUNCIL FOR ALCOHOL AND DRUG	Mixed-Use Transit Corridor	135 002
11	ELM LEASING LLC	Industrial	135B H 006
12	MARION ENVIRONMENTAL INCORPORATED	Industrial	135B H 001
13	SIGNAL MTN CEMENT CO	Industrial	126 010
14	ROBBINS JOE (SUBDIVEDED INTO TWO PARCELS)	Industrial	126J A 001.01 126J A 023
15	WINDRIDGE APARTMENTS LTD	Multi-Family Residential	126J A 001
16	BAYLOR SCHOOL	Education	126J A 027
17	BAYLOR SCHOOL THE	Education	126G A 006
18	WEAVER TREE FARMS INC	Commercial	126G A 002
19	BAYLOR SCHOOL THE	Education	126G A 007
20	WEAVER TREE FARMS INC	Single Family Residential	126G A 001
21	BAYLOR SCHOOL THE	Education	126G A 008
22	BAYLOR SCHOOL THE	Education	126G A 008.01
23	BYRD TYRONE & BETH D	Single Family Residential	126B A 008
24	MOUNTAINPRIZE INC	Commercial	126B A 007
25	BAYLOR SCHOOL THE	Education	126G A 009
26	KOMATSU AMERICA CORP	Industrial	1170 A 008
27	BAYLOR SCHOOL	Education	126G A 010
28	WOODWARD GROUP LLC THE	Commercial	126B A 006
29	HAMILTON COUNTY	Commercial	126B A 006.01
30	SCHREINER DEVELOPMENT LLC	Single Family Residential	126B A 005
31	BAYLOR SCHOOL	Education	126B A 004
32	WAL-MART REAL ESTATE BUSINESS TRUST	Commercial	126B A 002
33	BRIGHT-MEYERS SIGNAL MTN ASSOC	Industrial	126B A 002.01
34	SIGNAL MOUNTAIN, LLC	Commercial	117J B 010
35	BAYLOR SCHOOL	Education	126 003
36	BAYLOR SCHOOL	Education	126 001
37	CHATT CITY OF	Industrial	117P C 006

Map ID #	Owner	Land Use	PIN
38	KEEF NICK G JR & BONNIE C	Industrial	117P C 029
39	CHATT CITY OF	Industrial	117P C 028
40	CHATT CITY OF	Industrial	117P C 027
41	EDMONDS J E TRUSTEE	High Density Residential	117 008
42	SIGNAL MOUNTAIN CEMENT COMPANY	Single Family Residential	117 004
43	APPLING ONE LLC	Commercial	126N H 002.03
44	WILLIAMS SUSAN	Commercial	126N H 005
45	WAC PROPERTIES LLC	Commercial	126N H 005.02
46	SUNSOLAR ENERGY USA LLC	Commercial	126N H 005.04
47	BBC PROPERTIES LLC	Low-Density Residential	135C D 017
48	CHATTANOOGA CITY OF	Greenspace/Conservation	126N J 004
49	CHATTANOOGA CITY OF	Greenspace/Conservation	126N D 003
50	CHATTANOOGA CITY OF	Greenspace/Conservation	126N D 002
51	SOVRAN BANK TRUST DEPT	Single Family Residential	126N B 011
52	SHUFORD SAVANNAH GRACE	Single Family Residential	126N B 012
53	CHATTANOOGA CITY OF	Greenspace/Conservation	126N E 027
54	RED BANK CITY OF	Medium-Density Residential	126K B 001
55	ECG MOUNTAIN RIDGE LLC	Multi-Family Residential	126K B 002
56	RED BANK CITY OF	Medium-Density Residential	126L A 001.04
57	BROCK ARTHUR P ET AL	Single Family Residential	126E A 007
58	NOVEMBER PAPA PROPERTIES LLC (RECENTLY SUBDIVIDED INTO MULTIPLE UNITS)	Multi-Family Residential	
59	NOVEMBER PAPA PROPERTIES LLC (RECENTLY SUBDIVIDED INTO MULTIPLE UNITS)	Single Family Residential	
60	NOVEMBER PAPA PROPERTIES LLC (RECENTLY SUBDIVIDED INTO MULTIPLE UNITS)	Single Family Residential	
61	RUFFNER WILLIAM G	Single Family Residential	126F F 016.01
62	CITY WATER COMPANY	Single Family Residential	126D F 003
63	CHATT MEMORIAL PARK CEMETERY	Cemetery	126D F 002 S011
64	RED BANK CITY OF WHITEOAK	Single Family Residential	126D F 001
65	CHATT MEMORIAL PARK CEMETERY	Cemetery	117M G 001
66	FUGATE LAWRENCE E JR & MARY A	Medium-Density Residential	117L M 028
67	FUGATE LAWRENCE E JR & MARY A	Medium-Density Residential	117L M 028.01
68	LAYNE CLYDE & BETTY	Commercial	117L M 029
69	LT PROPERTIES LLC	Low-Density Residential	117L M 001.01
70	HAMILTON COUNTY	Mixed Use Transit Corridor	135F F 008.01
71	PC CHEROKEE HOLDINGS LLC	Mixed Use Transit Corridor	135F F 008.02
72	CHATT PRINTING & ENGRAVING LLC	Mixed Use Transit Corridor	135F F 008
73	SHREE RIDDHI, INC	Mixed Use Transit Corridor	135F L 015
74	ORTH SHORE PROJECT LLC	Mixed Use Transit Corridor	135F G 004
75	ROCK-TENN CONVERTING CO	Industrial	135G E 005





Map ID #	Owner	Land Use	PIN
76	RANDOLPH GLENNA	Low-Density Residential	1090 A 001
77	RI TN 2 LLC	Commercial	1090 E 001
78	NORTH THRUSHWOOD CONDOMINIUMS (MULTIPLE OWNERS)	Medium-Density Residential	1090 E 002.01-.15
79	FREDERICK AARON	Single Family Residential	118B L 023.01
80	ST PETERS EPISCOPAL CHURCH	Single Family Residential	118C A 003
81	BURNHAM TIM	Single Family Residential	118C A 018
82	HIKSON COURT APARTMENTS L P	Multi-Family Residential	118C B 001
83	SIMS MATHEW	Mixed-Use Transit Corridor	118C D 004
84	SIMS MATHEW	Mixed-Use Transit Corridor	118C D 003
85	SIMS MATHEW	Mixed-Use Transit Corridor	118C D 001
86	MOSS RAY E III	Mixed-Use Transit Corridor	118C D 027.01
87	MOSS RAY E III	Mixed-Use Transit Corridor	118C D 027.02
88	SAHELI CORPORATION	Mixed-Use Transit Corridor	118C D 027.03
89	HIGHLANDS DEVELOPMENT PARTNERS LLC	Mixed-Use Transit Corridor	118F F 001
90	RIVERTON PARTNERS	Mixed	118F C 048
91	CHATT CITY OF	Multi-Family Residential	118F C 047
92	RIVERTON PARTNERS	Multi-Family Residential	118F C 046
93	GIRLS PREPARATORY SCHOOL	Office	118K A 046.01
94	CHATT CITY OF	Greenspace/Conservation	118K A 009
95	RIVERTON DEVELOPMENT PARTNERS	Mixed-Use Transit Corridor	118K A 046
96	CHATT CITY OF	Greenspace/Conservation	119H A 003.01
97	KORDSA INC (RECENTLY SUBDIVIDED INTO TWO PARCELS)	Industrial	119H A 003.02 119H A 003
98	UNITED STATES OF AMERICA	Conservation/Parks/Rec/Greenspace	119G B 001
99	CULTON INVESTMENTS LLC	Single Family Residential	118G K 008
100	RODGER IRIS T & RONNIE P	Single Family Residential	118G K 020
101	DILLARD STEPHEN RYAN TR	Single Family Residential	118G K 020.01
102	BEARD JOEL G	Single Family Residential	118G K 024
103	ENGLISH DANIEL L	Single Family Residential	118G K 023.01
104	O NEIL CLIFTON F TR	Mixed-Use Transit Corridor	118G J 027
105	LUPTON DRIVE BAPTIST CHURCH	Mixed-Use Transit Corridor	118G J 026
106	7-ELEVEN INC	Mixed-Use Transit	118F C 049
107	ALC HOLDINGS LLC	Single Family Residential	118E G 018.01
108	RTB HOLDINGS LLC	Single Family Residential	118E G 018
109	HAMPTON COMPANY & CHATT CITY	Single Family Residential	118E E 006.03





APPENDIX  
C Detailed Cost Estimates



NOTE: SEE  
PROJECTS 4 & 6  
ON THE  
FOLLOWING  
PAGE

NOTES ABOUT  
COST ESTIMATES

- Cost estimates are preliminary and subject to change. Inflation of 20-30% annual of cost should be considered when using for future planning and implementation.
- A 40% contingency was added to each phase, as planning level costs often cannot anticipate some detailed costs. A contingency will assure wiggle room and unanticipated costs.
- Do not use cost estimates for grant application after 2020, without verifying costs with a professional estimator.
- These are planning level costs. More detailed level costs that use survey and detail design further will be more accurate.

PHASE 1: Stringer's Ridge/White Oak Connector Greenway / Total 2.25 Miles				
Probable Cost Estimate				
Cost estimates are preliminary and subject to change.				
	Units	Quantity	Cost Per Unit	Costs
*Mobilization			TOTAL	\$38,353
Mobilization	LS	1	3% of construction Cost	\$38,352.74
Pathways				
G-5 & G-7 Re-surfaced Segment (Stringer's Ridge Park) / 1.04 Miles			TOTAL	\$551,252
10-foot concrete sidewalk (400 linear feet)	SF	4,000	\$20.00	\$80,000.00
Resurfaced Asphalt Roadbed (demo asphalt and repave)				
Demo of existing asphalt	SY	5,333	\$37.50	\$199,987.50
Aggregate base course (6" ABC Stone)	TN	960	\$45.00	\$43,200.00
2" Asphalt surface course, Type S9.5C	SY	6,094	\$16.00	\$97,504.00
Site Work				
Grading	LF	5,484	\$10.00	\$54,840.00
Clearing and Grubbing	AC	1.8	\$9,000.00	\$15,840.00
Undercut Excavation	CY	1,015.0	\$18.00	\$18,270.00
Temporary Silt Fence	LF	5,484	\$5.00	\$27,420.00
Seeding and Mulching	AC	2	\$5,000.00	\$9,000.00
Slope Matting	SY	820	\$4.50	\$3,690.00
6" Underdrain with Fabric & Stone	LF	100	\$15.00	\$1,500.00
G-9 (Stringer's Ridge to White Oak Park) / 0.71 Miles			TOTAL	\$331,331
10-foot Asphalt Greenway (3,765 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	904	\$45.00	\$40,680.00
2" Asphalt surface course, Type S9.5C	SY	4,183	\$16.00	\$66,928.00
10-foot concrete sidewalk (224 linear feet)	SF	2,240	\$20.00	\$44,800.00
Concrete sidewalk curb and gutter	LF	224	\$28.00	\$6,272.00
Safety railing for sidewalk	LF	224	\$60.00	\$13,440.00
Site Work				
Grading	LF	3,765	\$26.00	\$97,890.00
Clearing and Grubbing	AC	1.3	\$9,000.00	\$11,700.00
Undercut Excavation	CY	697.0	\$18.00	\$12,546.00
Temporary Silt Fence	LF	3,765	\$5.00	\$18,825.00
Seeding and Mulching	AC	1.3	\$5,000.00	\$6,250.00
Slope Matting	SY	2,000	\$4.50	\$9,000.00
6" Underdrain with Fabric & Stone	LF	200	\$15.00	\$3,000.00
G-10 (Stringer's Ridge to White Oak Park) / 0.45 Miles			TOTAL	\$234,036
10-foot Asphalt Greenway (2,241 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	538	\$45.00	\$24,210.00
2" Asphalt surface course, Type S9.5C	SY	2,490	\$16.00	\$39,840.00
10-foot concrete sidewalk (320 linear feet)	SF	3,200	\$20.00	\$64,000.00
8-foot concrete path expanded to 10 feet (for 230 linear feet)	SF	460	\$20.00	\$9,200.00
Restriping in church parking lot, reconfiguration of parking, paint greenway green	LS	1	\$5,000.00	\$5,000.00
Site Work				
Grading	LF	2241	\$26.00	\$58,266.00
Clearing and Grubbing	AC	0.75	\$9,000.00	\$6,750.00
Undercut Excavation	CY	415	\$18.00	\$7,470.00
Temporary Silt Fence	LF	2500	\$4.00	\$10,000.00
Seeding and Mulching	AC	0.75	\$5,000.00	\$3,750.00
Slope Matting	SY	900	\$4.50	\$4,050.00
6" Underdrain with Fabric & Stone	LF	100.00	\$15.00	\$1,500.00
G-11 (Along Memorial Drive) / 0.06 Miles			TOTAL	\$30,776
10-foot Asphalt Greenway (346 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	121	\$45.00	\$5,445.00
2" Asphalt surface course, Type S9.5C	SY	384	\$16.00	\$6,144.00
Site Work				
Grading	LF	320	\$16.00	\$5,120.00
Clearing and Grubbing	AC	0.50	\$9,000.00	\$4,500.00
Undercut Excavation	CY	64	\$18.00	\$1,152.00
Temporary Silt Fence	LF	670	\$5.00	\$3,350.00
Seeding and Mulching	AC	0.50	\$5,000.00	\$2,500.00
Slope Matting	SY	370	\$4.50	\$1,665.00
6" Underdrain with Fabric & Stone	LF	60.00	\$15.00	\$900.00
Site Work (Other)			TOTAL	\$80,000
Stringer's Ridge Park Bell Ave. Trailhead Upgrades (resurface trailhead and add guardrail for parking)	LS	1	\$65,000.00	\$80,000.00
Road Crossings			TOTAL	\$15,000
High Visibility Crosswalks (Crossing, truncated domes, and signage)	EA	3	\$5,000.00	\$15,000.00
Includes crossing at Midvale Ave, Memorial Ave, and James Ave				
Amenities			TOTAL	\$36,030
Signage (Wayfinding)	EA	7	\$1,000.00	\$7,000.00
Bike Racks (powder coated) and Concrete Pad	EA	1	\$830.00	\$830.00
Steel hinged bollard	EA	2	\$2,100.00	\$4,200.00
Kiosk	EA	3	\$8,000.00	\$24,000.00
Survey, Design & Permitting			TOTAL	\$322,713
Design Construction Documents & Engineering (average 15%)		15%		\$197,516.59
Construction Administration (Average 10%)				\$105,196.52
Surveying (control, anthropogenic features, topography, substantial trees anticipated within primary use areas and contiguous trail/road areas) based on a 50' width	AC	4.00	\$5,000.00	\$20,000
			SUBTOTAL	\$1,639,490
			40% Contingency	\$655,796
			TOTAL	\$2,295,286
* earthwork estimated until a grading plan has been developed				

PHASE 3: Cherokee Boulevard Two-Way Cycle Track / Total .85 Miles				
Probable Cost Estimate				
Cost estimates are preliminary and subject to change.				
	Units	Quantity	Cost Per Unit	Costs
*Mobilization			TOTAL	\$58,516
Mobilization	LS	1	3% of construction Cost	\$58,516.20
Pathways				
Cherokee Boulevard Two-Way Cycle Track			TOTAL	\$1,931,220
3,380 lf of cycle track, including stormwater control measures (cost based on similar project in Columbia, TN)	LF	3,380	\$569.00	\$1,923,220.00
(Assumed project does not require significant utility relocation)				
Reconfiguration of parking striping for two properties	LS	1.0	\$8,000.00	\$8,000.00
Road Crossings			TOTAL	\$5,000
High Visibility Crosswalks (Crossing, truncated domes, and signage)	EA	1	\$5,000.00	\$5,000.00
Includes crossing at W Bell Ave (Manning St has signal and crosswalks)				
Amenities			TOTAL	\$14,320
Signage (Wayfinding)	EA	3	\$1,000.00	\$3,000.00
Bike Racks (powder coated) and Concrete Pad	EA	4	\$830.00	\$3,320.00
Kiosk	EA	1	\$8,000.00	\$8,000.00
Survey, Design & Permitting			TOTAL	\$531,332
Design Construction Documents & Engineering (average 15%)		15%		\$301,358.43
Construction Administration (Average 10%)				\$198,973.62
Surveying (control, anthropogenic features, topography, substantial trees anticipated within primary use areas and contiguous trail/road areas) based on a 50' width	AC	6.20	\$5,000.00	\$31,000
			SUBTOTAL	\$2,540,388
			30% Contingency	\$762,116
			TOTAL	\$3,302,505
* earthwork estimated until a grading plan has been developed				
I				
Phase 5: Bike/Walk Boulevard Connection Through Red Bank / Total 1 Mile				
Probable Cost Estimate				
Cost estimates are preliminary and subject to change.				
	Units	Quantity	Cost Per Unit	Costs
*Mobilization			TOTAL	\$6,840
Mobilization	LS	1	3% of construction Cost	\$6,840.41
Pathways				
B-7, B-8, and B-9			TOTAL	\$129,600
Street painting / crosswalks /spot treatments on Ashmore Ave, Cross St, and Lyndon Ave	LF	4,320	\$30.00	\$129,600.00
(Assume spot treatment 300-feet from both sides of all intersections)				
G-11 (Along Memorial Drive) / 670 Feet			TOTAL	\$64,114
10-foot Asphalt Greenway (670 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	161	\$45.00	\$7,245.00
2" Asphalt surface course, Type S9.5C	SY	750	\$16.00	\$12,000.00
Site Work				
Grading	LF	161	\$26.00	\$4,186.00
Clearing and Grubbing	AC	0.25	\$9,000.00	\$2,250.00
Undercut Excavation	CY	40	\$18.00	\$720.00
Temporary Silt Fence	LF	670	\$5.00	\$3,350.00
Seeding and Mulching	AC	0.25	\$5,000.00	\$1,250.00
Slope Matting	SY	325	\$4.50	\$1,462.50
6" Underdrain with Fabric & Stone	LF	100.00	\$15.00	\$1,500.00
Fencing/barrier to rail line	LF	670.00	\$45.00	\$30,150.00
Road Crossings			TOTAL	\$10,000
High Visibility Crosswalks (Crossing, truncated domes, and signage)	EA	2	\$5,000.00	\$10,000.00
at Lyndon/Culver Intersection and Newberry Street				
Amenities			TOTAL	\$24,300
Kiosk (end of Piedmont Circle)	EA	1	\$8,000.00	\$8,000.00
Signage (Wayfinding)	EA	10	\$1,000.00	\$10,000.00
Steel hinged bollard	EA	3	\$2,100.00	\$6,300.00
Survey, Design & Permitting			TOTAL	\$53,172
Design Construction Documents & Engineering (average 15%)		15%		\$35,228.09
Construction Administration (average 10%)				\$15,444.04
Surveying (control, anthropogenic features, topography, substantial trees anticipated within primary use areas and contiguous trail/road areas) based on a 50' width.	AC	0.50	\$5,000.00	\$2,500
			SUBTOTAL	\$288,026
			40% Contingency	\$115,210
			TOTAL	\$403,236
* earthwork estimated until a grading plan has been developed				



PHASE 4: Hixson Pike to North River Soccer Fields Greenway / Total 2 Miles				
Probable Cost Estimate				
Cost estimates are preliminary and subject to change.				
	Units	Quantity	Cost Per Unit	Costs
*Mobilization			TOTAL	\$77,492
Mobilization	LS	1	3% of construction Cost	\$77,492.06
Pathways				
G-15 Hixson Pike/Lupton Drive Area Improvements			TOTAL	\$486,792
6-foot expansion of concrete to a 12-foot sidewalk, for 560 feet	SF	3,360	\$20.00	\$67,200.00
Safety railing for sidewalk and near culvert headwall	LF	575	\$60.00	\$34,500.00
Concrete box culvert addition (size assumption 8'x5')	LF	1,800	\$8.00	\$14,400.00
Demo and reconstruction of wingwall for box culvert	LS	1	\$20,000.00	\$20,000.00
Reconfiguration of road to allow for sidewalk expansion under bridge	LS	1	\$10,000.00	\$10,000.00
Resurfaced Asphalt Roadbed (demo asphalt and repave)				
Demo of existing asphalt	SY	5,333	\$37.50	\$199,987.50
Aggregate base course (6" ABC Stone)	TN	960	\$45.00	\$43,200.00
2" Asphalt surface course, Type S9.5C	SY	6,094	\$16.00	\$97,504.00
G-15 Hixson Pike/Lupton Drive Area Improvements			TOTAL	\$148,607
12-foot Asphalt Greenway (2,821 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	1,185	\$45.00	\$53,325.00
2" Asphalt surface course, Type S9.5C	SY	3,761	\$16.00	\$60,176.00
Site Work				
Grading	LF	2,821	\$26.00	\$73,346.00
Clearing and Grubbing	AC	1.7	\$9,000.00	\$15,300.00
Undercut Excavation	CY	627.0	\$18.00	\$11,286.00
Temporary Silt Fence	LF	3,500	\$5.00	\$17,500.00
Seeding and Mulching	AC	1.5	\$5,000.00	\$7,500.00
Slope Matting	SY	3,761	\$4.50	\$16,924.50
6" Underdrain with Fabric & Stone	LF	120	\$15.00	\$1,800.00
Fence removal/relocation (at Lupton Drive Soccer Fields)	LF	110	\$45.00	\$4,950.00
G-17 Dixie Drive to east of the CB Robinson Bridge			TOTAL	\$1,712,152
12-foot Asphalt Greenway (6,652 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	2,794	\$45.00	\$125,730.00
2" Asphalt surface course, Type S9.5C	SY	8,870	\$16.00	\$141,920.00
Site Work				
Grading	LF	6,652	\$26.00	\$172,952.00
Clearing and Grubbing	AC	3.7	\$9,000.00	\$33,300.00
Undercut Excavation	CY	1,480.0	\$18.00	\$26,640.00
Temporary Silt Fence	LF	6,652	\$5.00	\$33,260.00
Seeding and Mulching	AC	3.7	\$5,000.00	\$18,500.00
Slope Matting	SY	8,900	\$4.50	\$40,050.00
6" Underdrain with Fabric & Stone	LF	200	\$15.00	\$3,000.00
Safety railing on existing culvert	LF	20	\$65.00	\$1,300.00
Pedestrian bridges	SF	5,040	\$200.00	\$1,008,000.00
Rip-rap (Class IV) to fortify greenway underneath CB Robinson Bridge	TN	500	\$75.00	\$37,500.00
Planting and hardscape enhancements for river overlook areas	LS	1	\$70,000.00	\$70,000.00
G-19 CB East of CB Robinson Bridge to Trailhead at North River Soccer Fields			TOTAL	\$162,429
12-foot Asphalt Greenway (1,825 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	770	\$45.00	\$34,650.00
2" Asphalt surface course, Type S9.5C	SY	2,440	\$16.00	\$39,040.00
Site Work				
Grading	LF	1,825	\$26.00	\$47,450.00
Clearing and Grubbing	AC	1.0	\$9,000.00	\$9,000.00
Undercut Excavation	CY	405.0	\$18.00	\$7,290.00
Temporary Silt Fence	LF	1,850	\$5.00	\$9,250.00
Seeding and Mulching	AC	0.6	\$5,000.00	\$3,000.00
Slope Matting	SY	2,433	\$4.50	\$10,948.50
6" Underdrain with Fabric & Stone	LF	120	\$15.00	\$1,800.00
Road Crossings			TOTAL	\$30,000
Improved Crossing at Hixson Pk/Lupton Ave-High Visibility Crosswalks (Crossing, truncated domes, and signage)	EA	4	\$5,000.00	\$20,000.00
Includes crossing at Midvale Ave, Memorial Ave, and James Ave				
Improved Crossing-High Visibility Crosswalks (Crossing, truncated domes, and signage) (At soccer fields driveway and Dixie Dr)	EA	2	\$5,000.00	\$10,000.00
Amenities			TOTAL	\$43,090
Signage (Wayfinding)	EA	4	\$1,000.00	\$4,000.00
Bike Racks (powder coated) and Concrete Pad	EA	3	\$830.00	\$2,490.00
Steel hinged bollard	EA	6	\$2,100.00	\$12,600.00
Kiosk	EA	3	\$8,000.00	\$24,000.00
Survey, Design & Permitting			TOTAL	\$465,080
Design Construction Documents & Engineering (average 15%)		15%		\$387,460.28
Construction Administration (Average 10%)				\$9,120.00
Surveying (control, anthropogenic features, topography, substantial trees anticipated within primary use areas and contiguous trail/road areas) based on a 50' width	AC	13.70	\$5,000.00	\$68,500.00
			SUBTOTAL	\$3,125,641
			40% Contingency	\$1,250,256
			TOTAL	\$4,375,897
* earthwork estimated until a grading plan has been developed				

PHASE 6: Lupton Drive Rail-with-Trail / Total 1.52 Miles				
Probable Cost Estimate				
Cost estimates are preliminary and subject to change.				
	Units	Quantity	Cost Per Unit	Costs
*Mobilization			TOTAL	\$41,515
Mobilization	LS	1	3% of construction Cost	\$41,515.41
Pathways				
RWT-3 Piedmont Circle to Red Bank Municipal Boundary			TOTAL	\$323,730
10-foot Asphalt Greenway (2,200 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	770	\$45.00	\$34,650.00
2" Asphalt surface course, Type S9.5C	SY	2,444	\$16.00	\$39,104.00
Site Work				
Grading	LF	2,200	\$26.00	\$57,200.00
Clearing and Grubbing	AC	1.2	\$9,000.00	\$10,800.00
Undercut Excavation	CY	407.0	\$18.00	\$7,326.00
Temporary Silt Fence	LF	2,200	\$5.00	\$11,000.00
Seeding and Mulching	AC	1.0	\$5,000.00	\$5,000.00
Slope Matting	SY	4,900	\$4.50	\$22,050.00
6" Underdrain with Fabric & Stone	LF	120	\$15.00	\$1,800.00
36" RCP	LF	20	\$140.00	\$2,800.00
Headwall for 36" pipe	EA	1	\$3,000.00	\$3,000.00
Safety Railing on downhill side of greenway	LF	1,500	\$65.00	\$97,500.00
Chain link fence to separate greenway from Norfolk Southern Railroad	LF	700	\$45.00	\$31,500.00
RWT-3 Red Bank Municipal Boundary to Thrushwood Drive			TOTAL	\$285,437
10-foot Asphalt Greenway (1,750 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	613	\$45.00	\$27,585.00
2" Asphalt surface course, Type S9.5C	SY	1,945	\$16.00	\$31,120.00
Site Work				
Grading	LF	1,750	\$26.00	\$45,500.00
Clearing and Grubbing	AC	0.8	\$9,000.00	\$7,200.00
Undercut Excavation	CY	324.0	\$18.00	\$5,832.00
Temporary Silt Fence	LF	1,750	\$5.00	\$8,750.00
Seeding and Mulching	AC	0.6	\$5,000.00	\$3,000.00
Slope Matting	SY	1,800	\$4.50	\$8,100.00
6" Underdrain with Fabric & Stone	LF	120	\$15.00	\$1,800.00
36" RCP	LF	20	\$140.00	\$2,800.00
Headwall for 36" pipe	EA	1	\$3,000.00	\$3,000.00
Retaining wall	LF	300	\$90.00	\$27,000.00
Safety Railing on downhill side of greenway	LF	1,750	\$65.00	\$113,750.00
RWT-3 Thrushwood Drive to Hixson Pike			TOTAL	\$582,280
10-foot Asphalt Greenway (4,000 linear feet):				
Aggregate Base Course (6" ABC Stone)	TN	1,400	\$45.00	\$63,000.00
2" Asphalt surface course, Type S9.5C	SY	2,222	\$16.00	\$35,552.00
Site Work				
Grading	LF	4,000	\$26.00	\$104,000.00
Clearing and Grubbing	AC	1.8	\$9,000.00	\$16,560.00
Undercut Excavation	CY	740.0	\$18.00	\$13,320.00
Temporary Silt Fence	LF	4,000	\$5.00	\$20,000.00
Seeding and Mulching	AC	1.6	\$5,000.00	\$8,000.00
Slope Matting	SY	7,744	\$4.50	\$34,848.00
6" Underdrain with Fabric & Stone	LF	240	\$15.00	\$3,600.00
36" RCP	LF	60	\$140.00	\$8,400.00
Headwall for 36" pipe	EA	3	\$3,000.00	\$9,000.00
Retaining wall	LF	400	\$90.00	\$36,000.00
Safety Railing on downhill side of greenway	LF	2,500	\$65.00	\$162,500.00
Chain link fence to separate greenway from Norfolk Southern Railroad	LF	1,500	\$45.00	\$67,500.00
Road Crossings			TOTAL	\$25,000
Improved Crossing at Thrushwood Dr-High Visibility Crosswalks (Crossing, truncated domes, and signage)	EA	1	\$5,000.00	\$5,000.00
Rapid Flashing Beacon at Thrushwood Dr (note AADT not high but visibility is need)	EA	1	\$20,000.00	\$20,000.00
Amenities			TOTAL	\$167,400
Signage (Wayfinding)	EA	3	\$1,000.00	\$3,000.00
Steel hinged bollard	EA	4	\$2,100.00	\$8,400.00
Kiosk	EA	2	\$8,000.00	\$16,000.00
Trailhead improvements (if adjacent land is purchased at Thrushwood Dr)	LS	1	\$65,000.00	\$65,000.00
Trailhead improvements (if adjacent land is purchased off of Hixson Pike)	LS	1	\$75,000.00	\$75,000.00
Survey, Design & Permitting			TOTAL	\$263,104
Design Construction Documents & Engineering (average 15%)		15%		\$213,804.36
Construction Administration (Average 10%)				\$800.00
Surveying (control, anthropogenic features, topography, substantial trees anticipated within primary use areas and contiguous trail/road areas) based on a 50' width	AC	9.70	\$5,000.00	\$48,500.00
			SUBTOTAL	\$1,688,467
			40% Contingency	\$675,387
			TOTAL	\$2,363,853
* earthwork estimated until a grading plan has been developed				

## NOTES ABOUT COST ESTIMATES

- Cost estimates are preliminary and subject to change. Inflation of 20-30% annual of cost should be considered when using for future planning and implementation.

- A 40% contingency was added to each phase, as planning level costs often cannot anticipate some detailed costs. A contingency will assure wiggle room and unanticipated costs.

- Do not use cost estimates for grant application after 2020, without verifying costs with a professional estimator.

- These are planning level costs. More detailed level costs that use survey and detail design further will be more accurate.



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PHASE 1: Stringer's Ridge/White Oak Connector Greenway / Total 2.25 Miles				
CORRIDOR SEGMENT	AVERAGE ASSESSED LAND VALUE (DOES NOT INCLUDE BUILDING VALUE) PER ACRE	PROPERTIES CONSIDERED IN COST AVERAGE (PIN #)	ACRES NEEDED (50' EASEMENT TYPICAL, 10' IF ROAD ROW IS USED)	TOTAL COST
G-5, G-7, and G-9	all segments secured	NOT AVAILABLE TO THE PUBLIC	all segments secured	all segments secured
G-10	\$11,160		2.57	\$28,706.33
G-10	\$7,100		0.37	\$2,650.28
G-10	\$58,870		0.09	\$5,135.55
G-11	\$30,000		0.04	\$1,163.91
G-11	\$208,333		0.03	\$6,504.44
			Contingency, 25%, SUBTOTAL:	\$11,040.13
			TOTAL COST OF EASEMENTS (IF ASSUMED NONE ARE DONATED)	\$47,532.28

PHASE 3: Cherokee Boulevard Two-Way Cycle Track / Total .85 Miles

Assumed Cherokee Boulevard ROW is used. Some easements may be needed if preliminary engineering requires it.

PHASE 4: Hixson Pike to North River Soccer Fields Greenway / Total 2 Miles				
CORRIDOR SEGMENT	AVERAGE ASSESSED LAND VALUE (DOES NOT INCLUDE BUILDING VALUE) PER ACRE	PROPERTIES CONSIDERED IN COST AVERAGE (PIN #)	ACRES NEEDED (50' EASEMENT TYPICAL, 10' IF ROAD ROW IS USED)	TOTAL COST
G-15	\$113,232	NOT AVAILABLE TO THE PUBLIC	0.14	\$15,466.77
G-15	\$113,232		0.15	\$16,896.47
G-15	\$147,143		0.05	\$7,735.47
G-15	\$196,667		0.03	\$5,372.67
G-15	\$75,018		3.24	\$242,913.79
G-17	\$52,272		7.30	\$381,716.74
G-19	all segments secured		all segments secured	all segments secured
			Before contingency	\$670,101.90
			Contingency, 25%, SUBTOTAL:	\$167,525.47
			TOTAL COST OF EASEMENTS (IF ASSUMED NONE ARE DONATED)	\$837,627.37

Phase 5: Bike/Walk Boulevard Connection Through Red Bank / Total 1 Mile

CORRIDOR SEGMENT	AVERAGE ASSESSED LAND VALUE (DOES NOT INCLUDE BUILDING VALUE) PER ACRE	PROPERTIES CONSIDERED IN COST AVERAGE (PIN #)	ACRES NEEDED (50' EASEMENT TYPICAL, 10' IF ROAD ROW IS USED)	TOTAL COST	
G-12 A	\$113,333	NOT AVAILABLE TO THE PUBLIC	0.19	\$21,204.47	
G-12 A	\$85,185		0.19	\$16,426.90	
G-12 A	\$33,879		0.20	\$6,766.37	
G-12 A	\$28,226		0.18	\$4,989.41	
			Before contingency	\$49,387.14	
			Contingency, 25%, SUBTOTAL:	\$12,346.79	
			TOTAL COST OF EASEMENTS (IF ASSUMED NONE ARE DONATED)*	\$61,733.93	
*Assumed ROW is used. Some easements may be needed if preliminary engineering requires it.					

\*Assumed ROW is used. Some easements may be needed if preliminary engineering requires it.

PHASE 6: Lupton Drive Rail-with-Trail / Total 1.52 Miles (Purchase would be almost entirely Norfolk Southern Railroad property)					
CORRIDOR SEGMENT	AVERAGE ASSESSED LAND VALUE (DOES NOT INCLUDE BUILDING VALUE) PER ACRE	PROPERTIES CONSIDERED IN COST AVERAGE (PIN #)	ACRES NEEDED (50' EASEMENT TYPICAL, 10' IF ROAD ROW IS USED)	TOTAL COST	
RWT-3	\$78,257	Average acreage price of all assessed land prices (not including buildings) of parcels from Piedmont Circle to Thrushwood Drive 117L_M_028	4.53	\$354,814.24	
RWT-3	\$75,018		4.59	\$344,436.42	
			Before contingency	\$699,250.66	
			Contingency, 25%, SUBTOTAL:	\$174,812.66	
			TOTAL COST OF EASEMENTS (IF ASSUMED NONE ARE DONATED)	\$874,063.32	





APPENDIX  
D *Public Survey Comments*



PUBLIC COMMENTS & CONCERNS (VIA PUBLIC SURVEY)

Great job on this project!

Love this project! The "most excited" ranking project was difficult to fill in since there were more than 4 phases to rank.

This would really break barriers and hopefully encourage more people to commute by bike that live in these areas. I fully support this!

Funding, whether people will use it, hard to walk or bike up huge hills for most people, whether there will be maintenance once it's built or if the city will just let it fall down, whether taxes will be increased to get this done (and the schools want an increase too).

Have police regulate the speed of bikers and other rec. transportation vehicles.

Connections between neighborhoods & cultural resource are a win for all!

I hope that rails to trails can be utilized extensively because it is ready made, and all of the rails north of the river are used very sparingly. But expect Norfolk Southern to fight it.

I fully support the bike lanes and greenway initiatives, however, I strongly think that it has been poorly planned. The bike lanes should be moved off main thoroughfares, this would reduce bicyclist's exposure and enhance motor traffic. As the system is, it's like the city government is willing for a few bicyclist's to die to force an agenda on the public and increase motorist commute times.

Your question about phases is confusing. The question lists 8 "phases" but the accompanying map only shows 4 "phases." The map shows 8 "individual projects" which I assume was what you meant when asking about my level of excitement. This could use some clarification. Thank you for moving forward with this project!

Do it quick! The people need this!

I love great safe places to run and bike!! Bring it on!!!

I would love a way to bike to Hixson and red bank.

The CB Robinson Bridge should absolutely be opened up to bicycle traffic!!

We need to improve our bus transit system. The current bus system doesn't run in certain areas till after lunch on Sundays, and does not on most holidays. We need to concentrate on Existing roads, paths and sidewalks. I'm super tired of my truck getting beat to death driving around my neighborhood of Orchard knob and Holland Park. The roads and sidewalks over here seem to be forgotten about except for the little bit of MLK that was paved last year.

Good luck!

I really hope this plan becomes reality!

Lets make it happen!

I moved to Chattanooga 1 year ago, and one of the major reasons I moved here was because of the bike-ability and the potential for Chattanooga to become an extremely bike friendly city in the next 5-10 years.

The map was hard to see or missing for many of these survey questions.

Excited! Wish it would finish in my lifetime

Press onward for more non car transportation/connection... also what accommodations will be considered for any e-scooter/bike programs

Start at one end & go to the other-inaccessible small middle sections are useless unless you live right beside them

Git 'er dun!!

Do not attempt to incorporate the big ridges with everything else. Cross is OK, but climbing is for the hardcore enthusiasts. So let's not waste money since those cyclists are already doing what they do.

The bike Chattanooga stations would be a great addition to this project!

Focus should be on private development & funds. City/County resources already stretched thin with existing maintenance and projects

A river crossing is key.

I live at the base of Signal Mtn but work downtown I would love to bike to work unfortunately I really worry about biking down Signal Mtn Rd until you pass under the 27 then come into Northshore, any improvement to make it more safe for bikers would be great!

This is exciting, impressive and a big part of why Chattanooga is awesome

Can we art of this greenway system be non-paved?

I live on the border of Red Bank and North Chattanooga (right by Stringers Ridge) if the biking sections mean reducing vehicular traffic lanes then I would consider moving out of the area. There is already an issue with traffic and the bike lanes that were added to the north shore/downtown area are useless. They are never used and only created traffic issues. If the city makes this mistake again I will relocate, I don't have time to sit in the car longer and cannot commute to work via bike.

Check out Minneapolis' city trail systems. So great for recreation and commute. If you build it, they will come!!!

Is there any way this can be fast-tracked?

Security and safety - for bodily harm or assault. Also encouragement to wear helmets and protective gear for all bikes, scooters, inline skates, etc.

We live and Southside, and we jog four miles everyday. We would love to have more safe trails or greenways that give us more beautiful views of Chattanooga.

We NEED this in Chattanooga!!

I have long wanted a safe way to bike/walk to downtown from Red Bank! There are many areas along Dayton Blvd (especially between Signal Mtn Rd and the tunnel) without sidewalks so my niece and I don't bike or walk downtown from home because of this. We have to load our bikes onto the car, then worry about parking when we get downtown. This new project sounds like its just what we need! We fully support!

Would like to see the fire range removed so the entire community of Chattanooga can enjoy the shoreline.

I fully support any improvements like this to encourage less vehicle traffic. I have ridden my bicycle to work since 2011 and these improvements will make my chances (and others) of being killed by a distracted driver less and less.

Love the vision!

"I used to commute from Hixson to downtown on my bike. This would be fantastic. Safety for cyclists from motor vehicles has become a big concern. It would be fantastic for this city to have a safe area away from vehicle traffic. We take our young son on the Riverwalk but it would be nice to have more. Thank you for considering this project! Getting out and enjoying life is so important. Chattanooga has so much to offer residents and tourists and this would make it even better!!"

I fully support this project, Chattanooga needs more places that are accessible by walking/biking!

As a wheelchair user who rides public transportation, I am super excited about this Greenway.

I bike to downtown from Ooltewah sometimes. I would like to see some greenways connecting the VW area and Enterprise South to downtown in the future.

I would be excited to see some sort of lane reduction on Dayton Blvd that would safely accommodate both pedestrians and bicyclists.

I love this idea! CHA needs this! Check out the Swamp Rabbit Trail in Greenville SC for a great example.

This is a great idea! I would use this greenway a lot and it would add a lot to our wonderful city

Please ensure that there are enough recycling and trash receptacles.And I recommend checking out the Nobody Trashes TN state campaign to partner with them re anti-littering. Thank you.

Excited about this project!

Can't wait for this to happen!

I've almost been hit multiple times while biking to The Northshore from Downtown Red Bank. This corridor would be amazing!

Thank you for all your work to make this a reality! I hope you're making racial and social equality a main focus of the planning. Thanks!



"Brainerd Road from Missionary Ridge to 153 is the dark hairy nasty smelling armpit of Chattanooga. Before you go and beautify Chattanooga with this lovely and beautiful Greenway, for God's sake PLEASE do something MAJOR and SEVERE to clean up Brainerd. It's horrible.  
The reason why you need to think about this is because you don't want Chattanooga to develop more of a stark difference between neighborhoods. There is already too much of a difference between good and bad neighborhoods around here"

I believe more pedestrian-friendly roadways will help connect Red Bank not only together, but other parts of town! I only hope there might eventually be plans that can help connect the more northern part of Dayton BLVD (north of Ashland Terrace)

So excited to see this project! The Red Bank-Signal Mountain corridor needs a connector and I appreciate how this ties in with existing greenways and parks.

Finding a way around the tunnel on Dayton/Cherokee

Please prioritize Lupton City and Red Bank. This area is growing and needs the investment in this type of project. Love where I live.

Love the concept!

Great work, thanks!

I would really like to see the Mountain Creek Greenway. It was added to the Master Greenway Plan but no progress has been made. The area around Mountain Creek is lacking accessible bike/walk trails

This is very exciting! I support green space, especially bike/walk/run paths, on this side of the river. I personally hope the extensions towards Red Bank and Signal Mountain become viable sooner than what is projected on the map.

Let’s make Chattanooga more bike friendly!!

lets do this

Would be so excited about this rivermont connection. One note would be that, as a runner, I would love for there to be an asphalt trail. Concrete causes knee pain for me so I can only walk on the riverwalk but could run if it were asphalt.

This would be a game changer in terms of being able to live away from downtown, but still have a bike commute! Sincerely hope you are able to pull it off.

Coordinate better, more frequent, public transportation with these options as well.

Even though I don’t live in Hamilton County, our family goes to Chattanooga often and LOVES the river walk. Thank you for investing in our town.

You're going to slow down the traffic flow. We have enough unused bicycle lanes

I love this idea. I’m 70 and I would use it if I live to see it done.

The SHNA is in full support of this project. We have been working within our neighborhood to make it more walkable to our surrounding areas.

Chattanooga is progressing. This is literally a good route to make change.

Would like to get involved from the Red Bank area

How close will these trails come to homes? The Mtn Creek trail from 15-20 yrs ago came within 15-20’ behind people’s home and would have cut my horse pasture from the horses barn! Stupid. So we stopped it. Think ahead & completely before you start or we will down it.

Happy to see the community grow in this manner.

Make it happen

Who's property is impacted by this plan and are they aware of it?

This would be an important benefit to the community

Let's keep building a great city.

Amazing plan, Chattanooga needs this type of environment. Please stop allowing so much residential development in areas that should remain as is and retain our natural beauty.

"Would be a great idea to connect to the Greenway Farms  
Is some way."

Security needs to be a priority.

Adding these greenways would be an added addition to the already beautiful city. Aiding the public to get outdoors and enjoy nature is a true gift to the public.

I believe the greenways are a great investment of our tax money. The increase in outdoor use and enjoyment of living in our city is worth every penny. I remember the Chattanooga on the late 70s and the change is incredible.

How long it will take and money

Bike lane on 319/ Dupont pkway would allow better access to riverwalk

This trail would be awesome for red Bank

Preserving wildlife habitats

I would LOVE to see Red Bank connected to all the existing bike paths!

It would be a dream to commute to work via bike. I'd love to reduce my carbon footprint so this is a great movement!

Instead of using the money to build more parks and such, why not use this money to fix the roads? We need that more than a new park.  
Many young people with dogs/children have moved to SH and a trail would be great for health and safety reasons

Safety is a concern, both on the trails and parking in parking areas. There should be cameras throughout.  
I hope these projects will be dog friendly

Hurry up!

"The routing of Project/Phase 1 seems to be a very squiggly line especially around stringers ridge. Why is this? Is there no possibility to create a straight corridor to North Shore Commercial or Downtown? Note: I would mostly commute to downtown.

Also from Lupton City it seems a quite a detour via Red Bank. Did you consider a more direct connection from Lupton City to Downtown via Hixson Pike or even closer to the river?"

I think this is a wonderful idea. As a Red Bank homeowner and a recreational cyclist, this project serves so many purposes: bringing additional outdoor recreation options into Red Bank, connecting Northern Red Bank to Stringer's Ridge trails, gives cyclists a safer way to get from RB to Cherokee shopping/Coolidge/Downtown rather than going through the tunnel, gives folks a viable way to cycle the length of Dayton Blvd, etc etc. I could not be more excited to see this project unfolding

No, but thanks - this will bring the walk/bike area closer to our home - appreciated.

I think it would be awesome to use Ashmore Ave as a connection, I live on this road and it gets a heavily used by commuters, road cyclist, mountain bikers, runners, and some neighborhood walkers. As it sits now there are some blind turns that are dangerous for all of these user groups. And I hear that it might not be a feasible option but creating better access for cyclist though stringers ridge tunnel to connect into the N shore and downtown.

Safety of pedestrians and bikers from vehicles along busy roads is a priority for it to be safe for my family.

This would definitely help bring more attention and growth to Red Bank which really needs it.

connecting Rivermont Elementary

I’d like to see more opportunities for people with limited access to public transportation (I.e. residents of Red Bank not served by Public bus) if scooters had mandatory racks like bikes have, then it may be more of an option.

Just that what we have is wonderful and I look forward to this growing! And thanks! :)

I think this would be so amazing and SAFE!

Allow guns

Hope this succeeds!

Concerns for safety in more isolated areas, as a woman who would be biking solo, I would like to feel I can travel anywhere without fear of harassment and/or contact with a criminal element. Perhaps really good lighting and cameras along the paths would help eliminate such fears.

Great idea!!!! Should use part of the occupancy tax funds to pay for this project

Thank you for investing in this!  
This would be incredible! Let's make it happen!!!

I would commute to work if the Greenway system connected Hixson Pike to Cherokee.

Concerns for safety in more isolated areas, as a woman who would be biking solo, I would like to feel I can travel anywhere without fear of harassment and/or contact with a criminal element. Perhaps really good lighting and cameras along the paths would help eliminate such fears.

I hope this can be done soon!



The “bike trail” which uses Memorial Drive is too dangerous for bikers. Narrow, no lane, fast heavy traffic of cars.

Great idea, good for health and environment

Red Bank and Lupton City desperately need safe access via bike and walking to other downtown areas. This is so vital to our growth and connection and to healthy recreation for our areas! I would love to see more kids in these neighborhoods and I think this could help!

I would LOVE IT if there was paved sidewalk access like the Riverwalk, but on the North side of the river!!

I think addressing Hixson Pike pedestrian and bike access should be researched congruently with this study. That is the primary commercial access utilized for many who live near me in Stuart Heights. With the close proximity of what are considered essential commercial necessities, there's no reason to not have pedestrian and bike access to these hubs.

It's a great investment in our future.

I just wanted to be sure that the Lupton City area connects with the Riverwalk across the river.

Dallas Heights is neglected through all this. We are one mile from the North shore/ Frazier yet the side walks and road ways are treacherous! Please include us in this plan.

I would love to connect the StewartHeights pool to the north Chatt, Normal Park area.

Please consider features that would make it more likely that people with disabilities can enjoy it, like wide lanes so that there is plenty of room to pass others going on opposite direction; careful layout minimizing blind curves; access points that don’t include steps and aren’t crazy far from vehicle parking, to name a few. Thanks!

I personally value the quality of a bike facility over the quality, I would prefer a trail that my grandma could ride on over 50 miles of painted lanes

thank you for undertaking this

can you build this tomorrow, please?!

Use dark-sky friendly lighting! :) It's important to preserving not only our night skies, but also to the health of wildlife & migration patterns

Make the walks wide enough for bikes and people, or no bikes allowed