

# 4 Trails and Greenways

Greenways and trails provide non-motorized transportation options while also offering a chance to view and interact with nature.

## INTRODUCTION

Greenways and trails are extremely important assets in the Greensboro MPO region. Residents and visitors alike are drawn to Greensboro area greenways and trails and these facilities are a key part of the image of the city and region. This section of the BiPed Plan Update is focused on supporting, maintaining, expanding, and celebrating trails and greenways in the area.

Greenways and trails encourage active transportation and outdoor recreation, promote physical fitness and healthy lifestyles, strengthen the local economy, and preserve environmental, cultural and historically valuable areas. Although greenways and trails have similarities, they have some important differences too. The BiPed Plan Update defines these facilities in the following manner:

- **Trails** are mainly recreational in nature, but with some transportation uses. Trails are unpaved, of a natural surface, minimally developed, or improved with crushed stone or gravel. Trails serve walking and/or biking and are often located in environmentally sensitive areas and provide users access to healthy and affordable recreation and natural environments including wildlife, woodlands, fields, wetlands and waterways and diverse topography.
- **Greenways** are non-motorized transportation facilities with recreational benefits and uses. Also known as Shared-Use or Multi-Use Paths, Greenways are paved facilities intended to safely accommodate large numbers of pedestrians and bicyclists. New greenways must be built to ADA standards. Greenways are found in rural, suburban, and urban settings and connect people to commercial centers, schools, parks, recreation centers, neighborhoods, hospitals, outdoor resources, and other key destinations. Greenways encourage non-motorized traffic for everyday trips such as commuting to work or school, running errands, or making social visits. They complement the sidewalk and on-road bicycle network and attract different kinds of users that prefer greater separation from automobile traffic.



*Unpaved trails provide access to more environmentally sensitive areas and are generally oriented towards recreational uses.*



*Many greenways are heavily used for both transportation and recreation, including the Lake Daniel Greenway.*



## History of Trail and Greenway Development CITY OF GREENSBORO

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The City of Greensboro has been building greenways and trails since the 1970's. In 1997, the Greensboro Parks and Recreation Department recognized the need to consolidate the existing system of trails and greenways and coordinate the future of these facilities by establishing a Trails and Greenways Division and enacting a Parks & Recreation Master Plan to address them. Prior to that time the trails in Greensboro were developed and maintained by various sections of the Parks and Recreation Department, including Regional Parks, the Park Maintenance Division, and City Lakes. In the beginning of the development of trails in Greensboro volunteer assistance from local clubs was a crucial resource. Their efforts contributed to the construction and maintenance of trails, bridges, and boardwalks that are currently in place. The Trails section, created in 1997, maintained existing trails and fostered the development of a more comprehensive trails system. The Trails section grew to contain a manager, program coordinator, and a maintenance supervisor with one part time and two full time maintenance employees.

## GUILFORD COUNTY

Guilford County began developing greenways in the 1990s with planning and the passage of a bond referendum for construction of the Bicentennial Greenway, a 17 mile greenway with some sidewalk connector sections linking Greensboro and High Point. In addition Guilford County owns 7 regional parks including Bur-Mil Park, Gibson Park, Hagan-Stone Park, Northeast Park, Southwest Park, Triad Park, and Guilford-Mckintosh Park. Many of these parks include trails and greenways for hiking and biking. While most of these greenways and trails are contained within the boundaries of each park, there have been efforts to connect them to larger regional systems. For example, Bur-Mil Park has a portion of the Atlantic & Yadkin Greenway (A&Y) running through it and Gibson Park functions as a trailhead for the High Point section of the Bicentennial Greenway. Triad Park has several paved and unpaved trails within its boundaries, and the Piedmont Greenway is planned to run through it. In addition, the County has acquired land for nature preserves and is developing

trails through these preserves when it can. A recent example is the Company Mill Nature Preserve, just east of Hagan-Stone Park, which is planned to have hiking trails and possibly mountain biking trails closer to Hagan-Stone. Guilford County has partnered with local municipalities and non-profits (such as the Piedmont Land Conservancy) to develop trails and greenways throughout the county.

## MPO AREA TOWNS

Trails and greenways within the incorporated towns of the Greensboro MPO have mostly been confined to garden and park trails, such as Hagan-Stone Park in Pleasant Garden or the Oak Ridge Town Park. More recently, however, the towns have begun to develop bicycle and pedestrian plans and town committees on greenways and trails for their jurisdictions in response to concerns from local residents about having safe bicycling and walking facilities. For example, Oak Ridge adopted its first Pedestrian Plan, the **Comprehensive Pedestrian Transportation Master Plan**, in October 2013. Their plan recommends over 27 miles of trails, not including the Haw River Trail and Piedmont Greenway which are also planned to run through Oak Ridge. Summerfield has convened a Trails and Open Space Committee in order to work towards defining a route for the A&Y Greenway through the town to link up with their town park and reach the Haw River on the north side of town. A feasibility study was completed in 2012 on extending the A&Y Greenway north through Summerfield and Stokesdale. Summerfield has used this study as a jumping-off point for the work of their committee.

The towns have utilized *NCDOT's Bicycle and Pedestrian Planning Grant Initiative* to develop their own bicycle and pedestrian plans that typically include trail and greenway recommendations. Oak Ridge received the grant to develop their Comprehensive Pedestrian Transportation Plan. Pleasant Garden was awarded the grant in 2013 and completed their plan in early 2015. The Town of Sedalia received the grant in the 2014 cycle and is expecting to complete their plan by the end of 2015. Each of these plans has greenway and/or trail elements within them along with on-street bicycle and pedestrian facilities.



## INFRASTRUCTURE

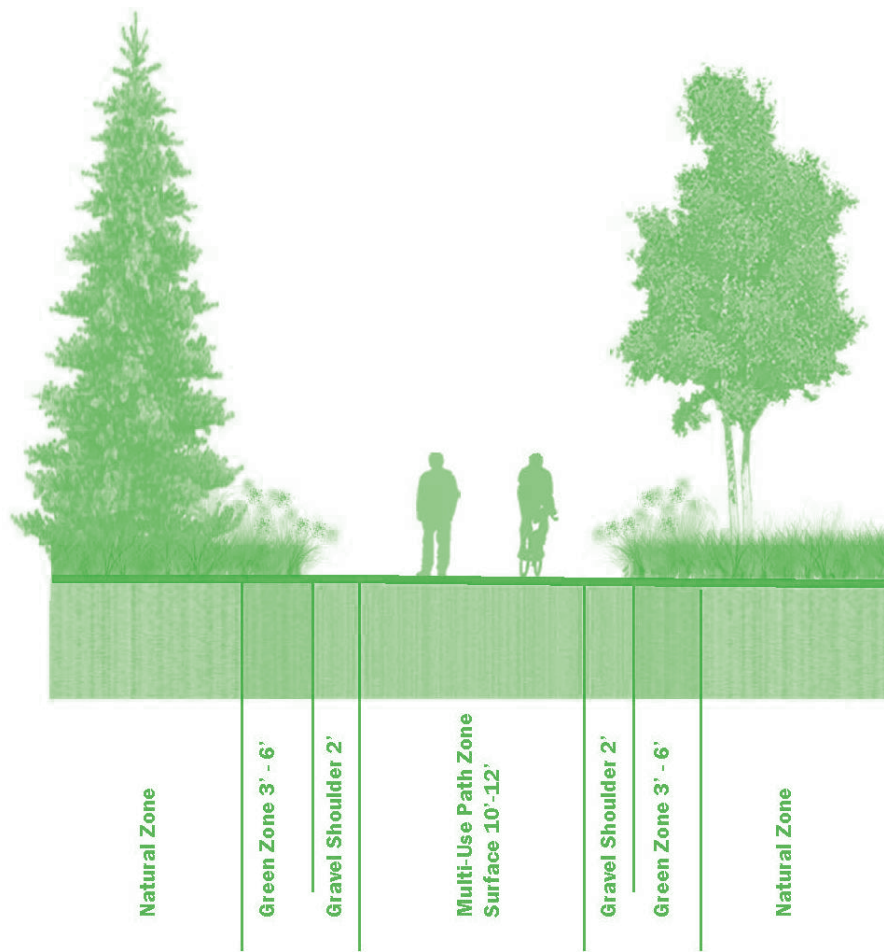
This section describes the greenway and trail infrastructure and existing conditions of the network. Additionally, it profiles a handful of the most significant existing facilities. The section also describes the process used to prioritize future construction and lists recommended future projects based on the prioritization and current project status.

### Trails & Greenways Accommodations TOOLBOX

Greenways and trails are the most prominent components of the facility network, but it is important to keep in mind the many supporting items necessary for safety and comfort and convenience. Roadway crossing treatments are quite important, though they are not unique to greenways. For that reason, the reader is directed back to the **“Toolbox” section of the Bicycle and Pedestrian chapters** for more information about regulatory signage, pavement markings including crosswalks, pedestrian refuge islands, crossing signals, and traffic calming measures. Various guidelines may also be used in designing trails and greenways, such as the North Carolina Complete Streets Planning and Design Guidelines, of which a cross-section example is shown here. In addition, greenway lighting is essential to safety on high-use urban greenways and optional in other locations depending on usage characteristics and demand and area type. Wayfinding signage can be a critical feature for informing users, especially when paths diverge or transition to other facilities, such as a trail leading to a sidewalk connector. Lighting and wayfinding signage will be discussed in the **Safety** section and the **Policies & Programs** section, respectively.

### EXISTING CONDITIONS

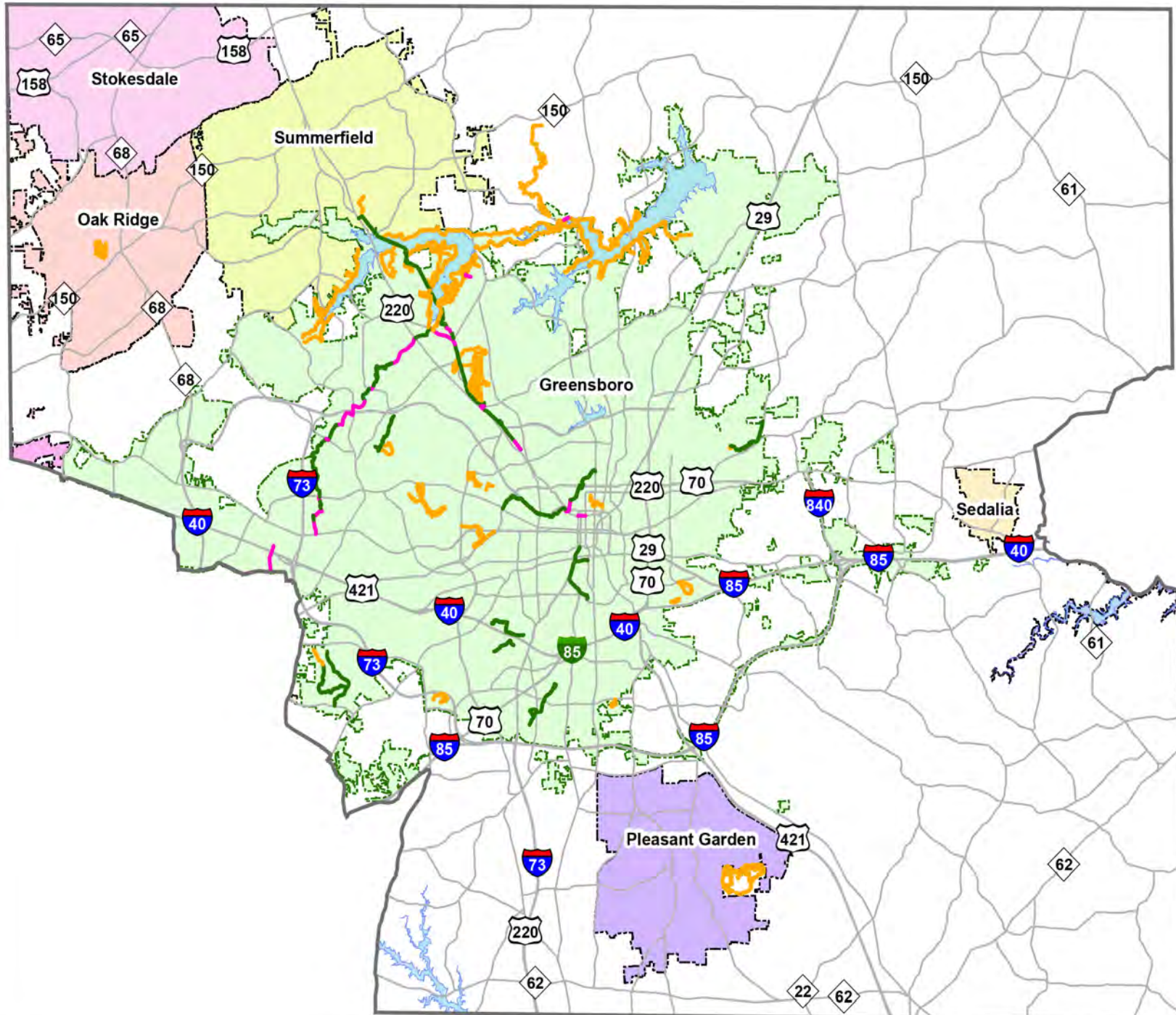
Within the Greensboro MPO there are 37 miles of public greenways and 75 miles of public natural surface trails for a total of 112 miles, almost all of which are off-road paths. In locations where a fully off-road path is not feasible, sidewalk or on-street “connectors” are used to create a link between the off-road sections. **Map 4-1** displays the existing network of trails, greenways, and connectors within the MPO. Since the first **BiPed Plan** was adopted in 2006, an additional 7 miles of greenways and 16



*Illustrative example of greenway/multi-use path cross-section from the North Carolina Complete Streets Planning and Design Guidelines.*

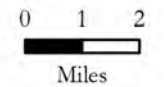
miles of trails have been built. This increase of 23 miles equates to a 26% increase in the mileage of the trail and greenway system throughout the MPO. Although much of this growth has occurred within the City of Greensboro, including the development of the Downtown Greenway, Battleground Rail Trail/A&Y Greenway, and several new trails, Guilford County has also developed new facilities in the past several years. This includes the completion of the final off-road sections of the Bicentennial Greenway in northwest Greensboro. Additionally, as described in the introduction, the incorporated towns of the Greensboro MPO have begun to plan for trails and greenways within their corporate limits.

Map 4-1  
EXISTING  
TRAILS &  
GREENWAYS



Legend

- Greenway
- Trail
- Connector
- Major Street
- Lake





## Major Greenways:

Several existing greenways are of particular significance due to their highly connective, transportation-oriented nature. These greenways are considered transportation corridors that are essentially streets on which access is limited to non-motorized transportation. More information on designating greenways as transportation corridors and its implications can be found in the **Infrastructure Recommendations** section of this chapter.

### 1. Downtown Greenway

The Downtown Greenway is a four mile greenway loop corridor around the downtown central business district in the City of Greensboro. The Downtown Greenway serves a unique role as the central hub of the regional greenway network, connecting to existing greenways including the A&Y Greenway, Lake Daniel Greenway, Latham Park Greenway, and Southeast Greenway; and planned future greenways such as the Vance Arlington Greenway and the Muddy Creek Greenway.

As of mid 2015, 0.91 miles are complete (parts of Phase 1 and Phase 3b) and 0.39 miles are pending construction (Phase 2e, 3a, and 3c) in late 2015 or early 2016. In addition, 1.79 miles are under design with construction expected for 2016 for Phases 1b1, 1b2, and 1b3 along Bragg St, and for 2017 for Phase 2 along Murrow Boulevard and Fisher Ave. Phase 1c between Martin Luther King Jr. Drive and Gate City Boulevard (0.17 miles) is expected to be built when the adjacent land is developed. Phase 4 of the Downtown Greenway, 0.69 miles, is currently under study with the A&Y Greenway extension to Downtown Greensboro, which includes another 1.96 miles, for a total of 2.65 miles of greenway. This final section is expected to be constructed within five years.

First conceived of in the *Greensboro Center City Master Plan (2001)*, the Downtown Greenway has become a significant community priority. Examples of this include its adoption as the signature project of the Greensboro Bicentennial Commission in 2007 and its identification as the first priority among six key projects in the **2010 Greensboro**

**Downtown Area Consolidated Plan.** The commitment of Action Greensboro, a local non-profit, is also notable. In addition to advocating for Downtown Greenway construction, Action Greensboro has raised hundreds of thousands of dollars and funded the installation of public art, enhanced landscaping, and other user amenities along the completed sections.



*Runners on the Downtown Greenway at Morehead Park.*

The Downtown Greenway project has also had a notable impact on downtown development. By mid-2014, with only  $\frac{3}{4}$  miles of the four mile loop completed, more than \$200 million in private development has occurred adjacent to or very near the Downtown Greenway sections. Significantly more investment is expected as the greenway implementation proceeds, making the Downtown Greenway a documented catalyst for downtown development and transformation.

### 2. Atlantic & Yadkin Greenway

The Atlantic & Yadkin Greenway consists of 7.5 miles of completed greenway, with another approximately 13.62 miles yet to be constructed on the northern and southern ends of the route. The route roughly follows the abandoned Atlantic-Yadkin railroad that used to connect Greensboro through northwest Guilford County to Mount Airy in Stokes County and its granite mining operations. The A&Y Greenway is therefore a highly strategic and connective route. In addition to connecting Summerfield, Stokesdale, and northwest Greensboro to Downtown Greensboro, the route connects to the Bicentennial Greenway, the future Piedmont Greenway, the Mountains to Sea Trail and the watershed trail network. Once completed, it will stretch for more than 21 miles.

The existing parts of the A&Y Greenway from just south of US 220 in Summerfield to Markland Drive in Greensboro were originally

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developed as three different segments: the Lake Brandt Greenway, completed in 1998; a portion of the Bicentennial Greenway, completed in 2001; and the Battleground Rail Trail, completed in 2010. This most recent section is highly urban and conveniently connects thousands of nearby and adjacent residents to retail, employment, and entertainment destinations through a congested commercial corridor environment. It also includes a major underpass at Cone Boulevard which was a million dollar investment.

One future section of the A&Y Greenway (2.65 miles) is to connect Markland Drive to Spring Garden Street in Downtown Greensboro. This includes Phase 4 of the Downtown Greenway. In October 2014, a major hurdle to this route was overcome when Chandler Concrete, the last rail user of the remaining tracks, sold its property along the railroad segment by Mill Street and terminated its service with the railroad company. A planning & preliminary design study is currently under way with construction expected within five years.

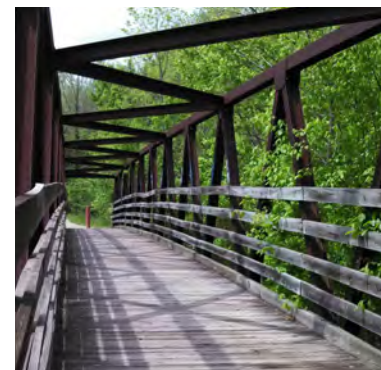
The other future section of the A&Y involves extending the greenway north through Summerfield and Stokesdale, an additional 11.66 miles. The Town of Summerfield has been actively studying the route and recently settled on a preferred alternative. As of mid-2015, the town is preparing to initiate a design contract for the first section. At the same time, NCDOT has recently installed an underpass as part of the US 220 widening project through Summerfield that will provide a safe and convenient crossing of what would have otherwise been a major barrier to north-south bicycle and pedestrian traffic.



*The A & Y Greenway is used by bicyclists, runners, pedestrians, and pets.*

## 3. The Bicentennial Greenway

Originally conceived in 1989 and supported by voter approved bonds, the Bicentennial Greenway has been the linchpin of Guilford County's trail building program, as a regional greenway to connect the City of Greensboro and the City of High Point. The County has built the trail, while the cities maintain it within their respective jurisdictions: ten miles in Greensboro and seven in High Point (roughly between the Piedmont Environmental Center and Gallimore Dairy Road). Some sections of this route are actually sidewalk and on-street bicycling routes rather than greenway. Two on-street connector sections of the Bicentennial Greenway route need additional bicycle and pedestrian improvements if they are to serve as on-street connecting links for non-motorized traffic: the connection between Boulder Road and South Swing Road on Burnt Poplar Road, and between Burnt Poplar Road and West Market Street on South Swing Road.



*This trestle bridge is part of the Bicentennial Greenway.*

## 4. The Piedmont Greenway

The Piedmont Greenway is an ongoing effort connecting the communities of Forsyth County to the communities in Guilford County. It is planned to be a 19-mile multi-use trail, with a 9-mile network of spur trails that will connect Greensboro to Kernersville, Triad Park, and Winston-Salem.



*Graphic rendering of the Piedmont Greenway going through an existing tunnel in Kernersville under Gralin St.*



Specifically in this study area, the Piedmont Greenway will connect Triad Park to the Watershed trails system at Lake Higgins. Presently, the Town of Kernersville is leading a study conducted in cooperation with Winston-Salem and Greensboro to route the Greenway from Kernersville to east of Triad Park. The Greensboro MPO has been working with Piedmont Land Conservancy to refine the planned routing for this trail to connect to Summerfield and the A&Y Greenway at the US 220 underpass.

### 5. The Southeast Greenway

This greenway has been made possible through a Parks and Recreation bond project. This greenway connects to the Downtown Greenway's southwest corner, James Elementary School, Warnersville Recreation Center, and terminates within Sussman Street Park. This greenway is 1.2 miles long and provides an off-road, bicycle and pedestrian connection into downtown Greensboro through its connection to the Downtown Greenway. This greenway was completed in 2013. From Sussman Street Park residents can also go east utilizing Bicycle Route 12 or sidewalk along Florida St to connect to Barber Park, the Gateway Gardens, and the Hayes-Taylor YMCA. This greenway would also connect to the planned Muddy Creek Greenway and the South Buffalo Creek Greenway. The Southeast Greenway supports the City of Greensboro's goal to improve and enhance greenway connections in underserved areas.



*The Southeast Greenway connects residents to the Downtown Greenway and to Bike Route 12.*

### Highlighted Trails:

There are certain unpaved, natural surface, hiking or mountain biking paths that significantly contribute to outdoor recreation in the Greensboro MPO area. They are highlighted below.

### 1. Mountains-to-Sea Trail

The Mountains-to-Sea Trail (MST) is envisioned to connect Clingman's Dome in the Great Smoky Mountains National Park to Jockey's Ridge State Park on the Outer Banks and is the flagship project of the North Carolina State Trails Program. Today, more than 600 miles of the 1,000 mile route are open for use. Partners across North Carolina are helping to plan and build the trail to link communities together and to serve as the backbone of a growing system of land and water trails. There are about 26 miles of the MST completed in the Greensboro MPO and future plans involve a ten mile section that connects from the watershed trails to Haw River State Park. Existing MST trails in the Greensboro MPO area include: Owls Roost, Nat Greene, Laurel Bluff, Peninsula, Townsend, Bill Craft Trail in the Richardson-Taylor Preserve and a portion of the A&Y Greenway.



*The Bill Craft Trail in the Richardson-Taylor Preserve allows MST travelers to experience important natural resources.*

### 2. The Watershed Trails

The Watershed Trails, as they are commonly called, represent a cluster of natural surface hiking and mountain biking trails that encircle the city's three reservoir lakes: Lake Higgins, Lake Brandt, and Lake Townsend. These trails are a unique asset for this area. Fifty miles of interconnected paths are available there and two major greenways (the A&Y Greenway and the Bicentennial Greenway) bridge the Watershed Trails to the greater system. These trails have great access to many amenities and landmarks in the MPO. The City of Greensboro's Lake Higgins and



*Parents and children enjoying interacting with nature in the Watershed Trails.*



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Lake Brandt Marina offer fishing, boating, shelters, paddling, and outdoor education opportunities and are easily accessible from many of the trails. Guilford County's Bur-Mil Park is a 250 acre park with indoor and outdoor rentable spaces, a nine-hole par 3 golf course, playgrounds, outdoor aquatic center, tennis courts and wildlife education center. Many special events and races choose Bur-Mil Park as their home base for its great access to the Watershed Trails. The Townsend Trail's eastern most trailhead is nestled among the expansive Bryan Park Complex which offers a multi-field soccer complex and stadium, shelters, playgrounds, 36 holes of championship golf, a golf practice and learning facility and the Bryan Enrichment Center that is available for meetings, weddings and special events.

### 3. Hagan-Stone Park Trails

Hagan-Stone Park in southern Guilford County has a fine trail network totaling approximately 6.3 miles. The park is a major asset for south eastern Guilford County and the Pleasant Garden area, and so makes a desirable focus for future trail and greenway connections.



*Hagan-Stone Park, on the east side of Pleasant Garden, not only has trails, but also camping facilities, fishing, playgrounds, a meeting & event center, and picnic shelters.*

## RECOMMENDATIONS

The **2006 BiPed Plan** recommended 100 new greenway and trail corridors throughout the Greensboro MPO, in order to develop a network of trails and greenways almost 420 miles long. The recommendations for this update to the BiPed Plan builds upon this proposed system and further identifies priorities within that system to determine the next greenway and trail projects to implement. The updated recommendations also incorporate planning efforts in the MPO Towns, which have identified new trails,

greenways, and sidepaths within their jurisdictions. This updated system of greenways and trails recommends over 460 miles of new facilities and identifies tiers for prioritization purposes.

Other recommendations relating to trails and greenways infrastructure include consolidating the naming of existing and proposed greenways and increasing the number of staff to plan and manage projects related to greenway and trail facilities. Consolidating the naming of certain greenways and trails will display their regional significance and connectivity across many neighborhoods. In addition, increasing staff will be necessary as the greenway and trail system continues to grow and requires greater management.

### **Recommended System of Trails and Greenways**

A construction priority matrix was developed by the MPO to understand which recommendations should have greater priority and help clarify implementation goals over the life of the BiPed Plan. The recommended system of trails and greenways were prioritized with a two-step process using GIS modeling:

**Step 1:** A point-based methodology was used to score the proposed trails and greenways using three primary criteria: Land use connectivity, Transportation system connectivity, and Safety and Mobility.

- Land use connectivity measures the extent to which a proposed trail or greenway provides a connection to or from a residential area, employment center, retail center, school, or park and recreation center within one mile. A higher score was assigned for a connection that is within a half mile of the proposed facility.
- Transportation system connectivity measures the extent to which a greenway or trail would enhance the following sorts of connections:
  - › Connections to a bus stop within a quarter or half mile: a higher score was assigned to connections within a quarter mile than a half mile;



- › Connections to a bike facility (bike lane, bike route, existing trail and greenway system), sidewalk, or transit connection: a higher score was assigned if the proposed trail or greenway connects to a bike facility and fills a facility gap;
- › Connections within an area underserved by bicycle infrastructure: measured by the percentage of the bicycle facility length over the total street length within a half mile buffer from the proposed trail or greenway- the smaller the percentage, the higher the score;
- › Extension of key parts of the regional greenway system (Bicentennial Greenway, Piedmont Greenway, A&Y Greenway, Downtown Greenway, and Mountains to Sea Trail) accrue additional points.
- Safety and Mobility:
  - › If a proposed trail or greenway addresses an existing safety problem such as a high bicycle and pedestrian crash location, a score was assigned.
  - › For mobility, the percentage of households below poverty over the total households was calculated, as well as the percentage of workers with no vehicle over the total number of workers within a half mile of a proposed trail or greenway. If the percentages are larger than certain thresholds, a score was assigned.

**Step 2:** After the scores were determined using the GIS modeling of the criteria above, the prioritization was finalized by taking into account geographic equity and local and community inputs. This included identifying ongoing priorities of the City of Greensboro, MPO towns, and regional priorities.

The resulting trails and greenways map displays planning-level recommendations for the MPO region. Certain greenways and trails are actively being pursued, such as those projects identified for City of Greensboro Bond funds. Most greenway and trail projects were identified through the planning process of the original BiPed Plan in 2006 but require additional review.

**Map 4-2** shows priorities for greenways, trails, and sidepaths (paved multi-use paths that closely parallel roadway facilities). The priorities are then divided into four tiers within each category, with Tier One being the highest priority and Tiers Two through Four being lesser priorities. Tier One projects are expected to be constructed in 1-5 years; Tier Two projects may be constructed in 5-10 years; and Tier Three and Four projects may be constructed between 10-20 years out or longer. Tier One priorities include:

- Downtown Greenway (all remaining phases)
- A&Y Greenway from Markland Drive to Downtown Greensboro
- A&Y Greenway from US 220 to Centerfield Road in Summerfield
- Vance Arlington Greenway
- Piedmont Greenway from Kernersville to Crosscreek Road
- N. Buffalo Creek Greenway from the Latham Park Greenway to Yanceyville Street
- Keeley Park Connector

Several notable Tier Two projects are outside of the city, including further extending the Piedmont Greenway east into Oak Ridge and Summerfield and the A&Y Greenway north into Stokesdale. The Implementation section describes the timeframe of greenway construction.

As noted above, many of the recommended trails and greenways need more detailed review beyond the high-level prioritization that has been completed for this plan. Therefore it is recommended that City and MPO staff proactively review the mid- and long-term priorities identified in the map to ensure their practical feasibility. Short-term projects that have ongoing work have generally already been vetted or are currently under review in some capacity.

In addition to reviewing future priorities for building new trails and greenways, it is important to consider how to improve biking and walking connections along existing facilities and that provide links between facilities. For example, the Bicentennial Greenway route is not entirely


### Map 4-2 GREENWAY & TRAIL PRIORITIES

#### Legend

##### Greenway

-  Tier 1
-  Tier 2
-  Tier 3
-  Tier 4

##### Trail

-  Tier 3
-  Tier 4

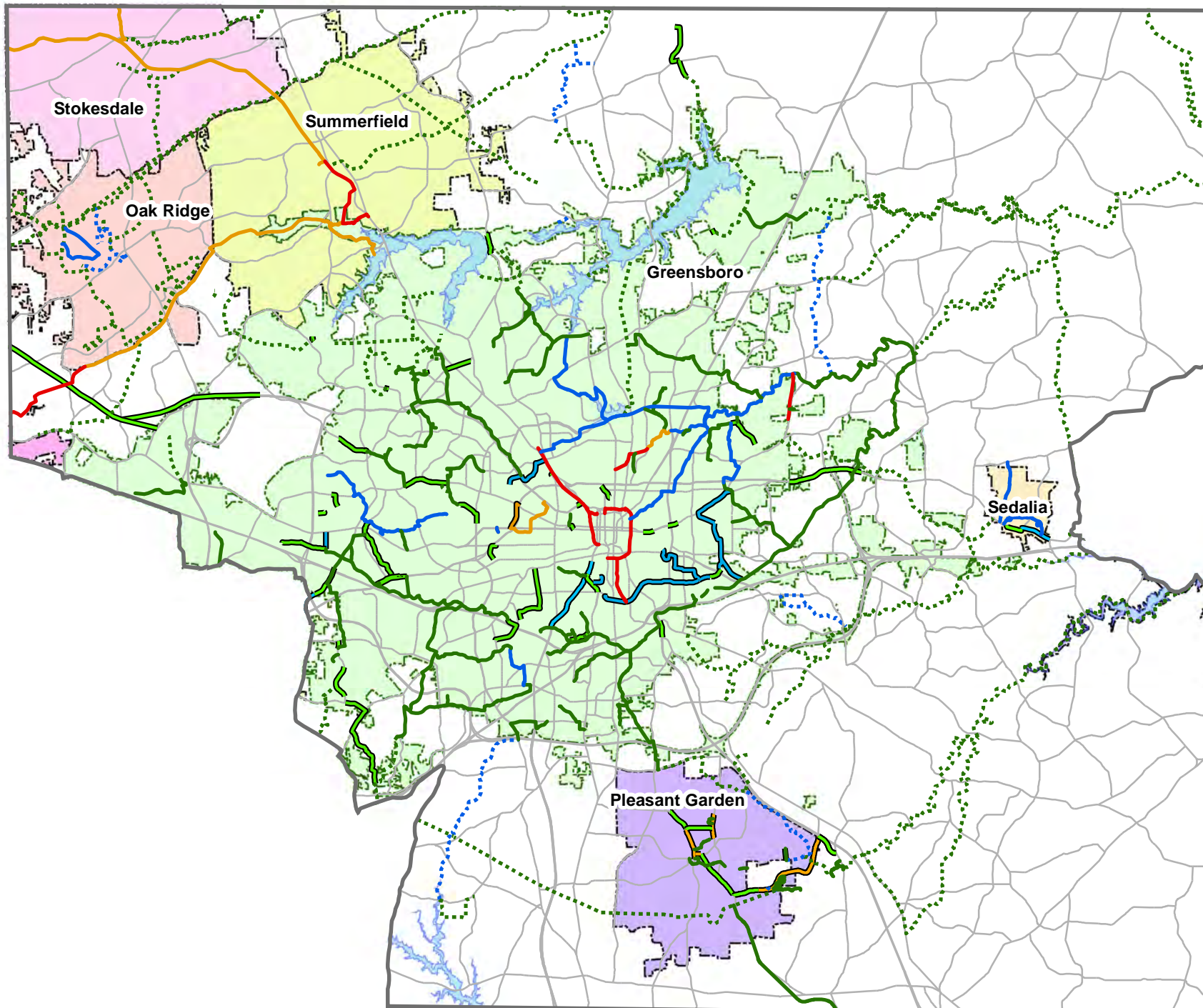
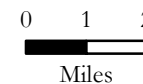
##### Other (\*)

-  Tier 2
-  Tier 3
-  Tier 4

*Other (\*): Connector  
& Sidepath*

*Tier 1: Short Term*

*Tier 4: Long Term*





off-street paths: on-street sidewalk and road connectors are included as well. These on-street connectors should be reviewed to ensure that they have adequate facilities and wayfinding for non-motorized users, and also if alternative off-street connections could be made. Replacing on-street connectors with off-street greenways wherever possible will provide a more consistent and comfortable experience for greenway and trail users.

Finally, future greenway and trail construction hinges upon continued funding from local sources. Although state and federal sources can sometimes be used, local funding is as a rule necessary to provide matching funds. Also, federal and state funding available for greenways and trails has remained stagnant or has decreased in recent years. Thus local jurisdictions cannot rely on federal and state resources to build out their off-road networks. This plan recommends that the City of Greensboro include greenway funding as part of the next transportation bond, as it has done in the past two bonds from 2000 and 2008. This plan also recommends that Guilford County seek approval of another bond for trails and greenways in order to continue its efforts to support regional projects such as the Piedmont Greenway and the A & Y Greenway through Summerfield and Stokesdale. MPO towns should also be prepared to commit local dollars to these off-road projects.

### **Consolidate Naming of Existing & Proposed Greenways**

There are several recommended facilities in BiPed that combine existing and proposed greenway routes. These routes need to be consolidated under one name to display their regional importance and connectivity across communities. For example, the A&Y Greenway used to have three different names because sections of it were completed at different times under different projects. Later, the route was joined under one name to give it greater significance in the community, reflect its link to the historic A&Y railway, and highlight its cross-town route. Short sections of greenway that are localized within a single neighborhood are less significant outside of the neighborhood context, but if they are linked together with other greenway sections they become vital connectors for pedestrian and



bicycle travel between communities. Their larger scope and impact becomes illuminated by the potential of creating an interconnected chain of safe and comfortable off-road paths. The following recommended greenways should be considered for consolidation with their existing counterparts:

- North Buffalo Creek Greenway – Arboretum Greenway, Lake Daniel & Latham Park Greenways, Northeast Community Trail
- South Buffalo Creek Greenway – Southeast Greenway, Bluford Loop Connector, Barber Park Trail, Hillsdale Greenway

As the network becomes more built out, other local greenway and trail sections may be considered for consolidation. Proposed facilities may also be combined in an effort to generate support across communities and demonstrate that the new facility will connect many residents.

### **Trails and Greenways Staffing Recommendation**

Whether they are built in the county, towns, or the City of Greensboro, trails and greenways require oversight and promotion facilitated by dedicated local staff. The types of work tasks that are necessary for continuing to grow the network and create an attractive and functional system include:

- natural surface trail and paved greenway maintenance and construction oversight
- securing and overseeing grant funding
- collaborating with non-profits on trail development projects
- promoting and educating residents and visitors about the system through events, exhibits, public meetings and other marketing efforts
- maintaining existing and proposed GIS trails layers
- implementing growing wayfinding and signage needs
- partnering with developers on integrating systems into developments
- coordinating interdepartmentally on system wide plans and land acquisition
- surveying users and monitoring trail usage counts
- implementing and overseeing the BiPed Plan in design and construction projects

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The City of Greensboro maintains and oversees the largest greenway and trail system within the MPO. Since 2006 the total miles of greenways and trails maintained by the City of Greensboro Parks and Recreation staff has grown by 26%. There are two full time administrative staff that perform the majority of the tasks described above although only one is solely dedicated to trails and greenways. It is essential that these staff remain in place to provide this support. However, demands on administrative staff are growing as the mileage of trails and greenways continues to increase. This plan recommends that at least one more staff person be added to the Parks and Recreation Department in order to separate out responsibilities for planning and development from marketing and promotion. These are two different, but equally important, parts of managing the system. Planning and developing the system is clearly important because the system must grow strategically and comprehensively. Marketing and programming the existing sections is important for encouraging residents and visitors to use the system, developing the greenway and trail system as a brand for the City, and creating healthier communities. Although it is possible that responsibilities such as construction oversight could be delegated to other internal city departments or areas within Parks and Recreation, shifting the burden elsewhere does not solve the root problem: a shortage of staff capacity.



*The construction of the A&Y Greenway will add two miles to the greenway system in the City.*

There are also many trails that exist outside of the City of Greensboro, in Guilford County. As trails and greenways are constructed within the limits of the MPO Towns, similar staff may be needed to perform the tasks listed above. Otherwise it will fall to Guilford County’s staff to manage these assets. However, the County also does not have the capacity to take on these

functions, except for when trails fall within specific parks and park staff becomes responsible. It is recommended that MPO Towns and the County review staffing needs as they pertain to trails and greenways, and provide adequate staffing resources to manage planning, development, marketing, and programming.

Maintenance of the trails and greenways also requires a core staff to complete this essential work. Recommendations for further maintenance staff growth are outlined in the **Maintenance** section.

## IMPLEMENTATION

### Greenways and Trails Construction

As the recommended system map for greenways and trails shows, many new greenway and trail routes are proposed for construction around the MPO planning area in the years ahead. It will take decades to fully build out this system. Effective prioritization of the proposed greenway routes will be necessary so that the highest priorities and most feasible routes are constructed in a timely manner. Even more important will be securing sufficient funding resources for this purpose over time. Securing dedicated local funding sources for greenways is an important recommendation of this plan. Doing that will make it possible for the area to pursue supplemental Federal and State grant funds. Trail construction has been accomplished with a mix of volunteer labor (notably with the mountain biking trails) and local staff labor. Supplementing this approach or at least securing dedicated resources will facilitate the timely development of additional trails.

Prioritization **Map 4-2** provides direction on what projects should be implemented next and when they may be expected to be constructed. As noted earlier, Tier One projects are expected to be constructed in 1-5 years; Tier 2 projects may be constructed in 5-10 years; and Tier Three and Four projects may be constructed between 10-20 years out or longer.

Funding for greenway and trail construction comes from various sources, which include:

1. **City of Greensboro Bonds:** Voters approved transportation bonds including funding for greenways in 2000 and 2008.



Parks and Recreation is still actively spending year 2000 bonds. The 2008 bond projects included \$7 million for the Downtown Greenway, which is being spent as new pieces become ready for construction. Additional greenway funds from the 2008 bond are slated to be released in 2018-19. Existing bond projects include:

- Downtown Greenway – construction and design ongoing
  - Southeast Greenway – completed in 2013
  - Bluford Loop Connector Greenway – completed in 2014
  - Vance Arlington Greenway – under design
  - Keeley Park Connector – under design
2. **Guilford County Trail Bonds:** Trails and greenways within Guilford County Parks and sections of the Bicentennial Greenway have been built with bond money dedicated by the County. Currently, this bond money has been used up and another bond is recommended to permit the County to continue its trail-building efforts.
  3. **Federal Transportation Funds:** The Greensboro MPO plays a key role in the identification, prioritization, and assignment of federal funding to area projects. This includes funding sources directed by the MPO: Surface Transportation Program-Direct Apportionment (STP-DA) and Transportation Alternatives Program (TAP). It also includes Federal Transportation Funds prioritized through the Greensboro MPO but selected by the NCDOT. These funds can be used for ADA- and AASHTO standards-compliant greenways that function as transportation corridors for bicycle and pedestrian movement. Federal funds have played a key role in development of major greenway sections including the A&Y Greenway (Battleground Rail Trail section), Downtown Greenway, and sections of the Bicentennial Greenway. Federal funds typically require local matching funds. These have come from City and County bonds.
  4. **State Trail Grants:** Greensboro Parks & Recreation/Guilford County has utilized the PARTF Grant (Parks and Recreation Trust Fund), the Adopt-A-Trail (AAT) Grant (eliminated in 2013) and the Recreational Trails Program (RTP) Grant that are awarded through the North Carolina Department of Environment and Natural Resources. These grants have assisted with the following projects since 2004:

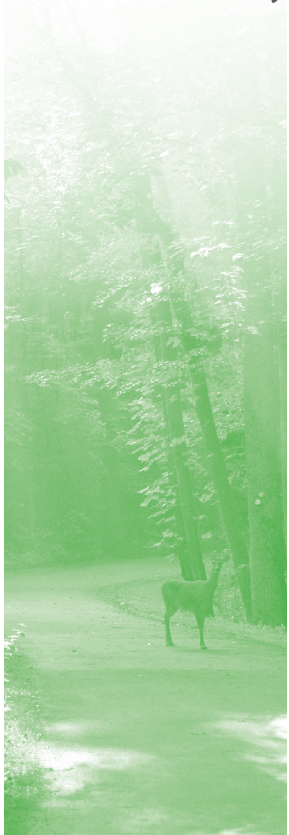
- Northeast Community Trail Construction – PARTF 2004
- Beech Bluff Trail Renovation and Repair Project – AAT 2005
- Trails of Greensboro Map Books – AAT 2006
- Bicentennial Greenway Erosion Control Project – RTP 2009
- Blue Heron Bridge and Boardwalk Project – AAT 2009
- Piedmont Trail Boardwalk Replacement Project – AAT 2010
- Trail System Signage Project – AAT 2011

5. **Private Foundations:** There have been several private foundations associated with the development of the Downtown Greenway and have provided funding for aspects of the greenway such as landscaping and programming. These foundations include:
  - The Joseph Bryan Foundation
  - Cone Health Foundation
  - Weaver Foundation
  - Cemala Foundation
  - Phillips Foundation
6. **Individual Donations:** For projects such as the Downtown Greenway, individual donations have been collected by Action Greensboro to fund greenway amenities including public art, construction and maintenance.
7. **Private Developers:** As developers and businesses recognize the importance of non-motorized transportation for attracting and retaining a young, active, healthy customer base and workforce, they are becoming interested in partnering with municipalities to build and maintain greenways. Developers of the Revolution Mill properties have sponsored a preliminary feasibility study into building a portion of the North Buffalo Creek Greenway through their property to connect to the current terminus of the Latham Park Greenway at N. Elm St.



Trail and greenway planning efforts have generally occurred on a more local scale and may not be coordinated with more regional efforts. To help develop better regional coordination, the Piedmont Triad Regional Council and Piedmont Land Conservancy organized a Trails Summit in May 2015 to bring together government representatives and

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stakeholders from Guilford County and the greater Piedmont Triad region. Presenters discussed current and future trail and greenway projects, and the need for more resources to complete these projects. The next step is to create a working group to support the completion of more trails and greenways with regional connections.

As noted in the recommendations, continued funding support will be necessary to implement current and future projects identified on the trails and greenways system recommendations map. It would be preferable that trails and greenways construction not be reliant on a patchwork of funding to complete projects, so creating a dedicated local funding source will be necessary to make it possible to connect the pieces of the off-road network and expand it on a regional scale.

***Consolidate Naming Existing Trails and Greenways***

If three or more existing trails and/or greenways overlap in a chain that creates a highly connective corridor, they should be considered for consolidation. Proposed greenways and trails may be treated similarly, if consolidating and renaming the different pieces would give a higher status to the corridor. However, public involvement will be necessary when it comes to renaming or re-branding existing greenway or trail corridors that have been historically known by different names. There also needs to be consensus on the exact name. Proposed corridors that do not have ongoing efforts are easier to change for future marketing.

The consolidation should be implemented on a continuing basis with the review of mid- and long-term proposed facilities. These future facilities will link up to existing facilities and create more connective corridors that may require a re-evaluation of marketing and promotional materials.

***Greenways and Trails Staff***

Hiring additional greenways and trails staff requires additional funding resources. For the City of Greensboro the Parks and Recreation Department would need to have an increased

budget in order to fill additional positions for the types of work recommended in this plan. Requesting a service enhancement during the budgeting process is the first step to securing the needed budget to hire additional staff. Another option that could be explored is to hire an outside service to assist with trails and greenways marketing efforts. Regardless, either option would require additional resources to implement.

Similarly for the MPO Towns and Guilford County, additional local funding will need to be leveraged to develop new positions that will make greenways and trails a priority.



## Usage and Volume

Pedestrian and bicycle volume counts on trails and greenways are important to planners for many reasons. One reason is that counts help identify which areas should receive priority for maintenance and improvements. Along these lines, understanding traffic volume and trends on trails and greenways helps planners polish infrastructure strategies such as installing more lights where there is more use in late evening, maintaining pavement surfaces, ensuring trail cleanliness, and planning for new greenway/trail connections to close gaps in the system. Please see the ***Non-motorized Counting Programs and Data Collection*** section of the ***Bicycle*** Chapter for a more detailed introduction to this topic. The following section introduces counting programs that the Greensboro MPO and City Parks and Recreation Department are currently working on. The Greensboro MPO and City Parks and Recreation Department not only conduct counting programs independently, but also cooperate closely with each other to expand counting efforts in the MPO area.

### EXISTING CONDITION/DATA

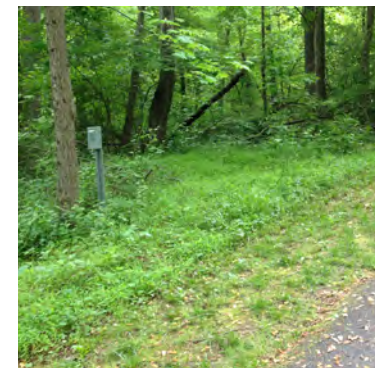
This section describes three counting programs to collect bicycle and pedestrian data on trail and greenway systems in the Greensboro MPO area, including the Greensboro Parks and Recreation Department counting program, GDOT counting program, and NCDOT counting program.

#### ***Greensboro Parks and Recreation Department Counting Program***

The Greensboro Parks and Recreation Department has been recording automated infrared trail counts for many years. Electronic trail counting can and has helped to: justify investments, understand usage patterns, anticipate trail/greenway degradation, quantify visitation, plan maintenance priorities and monitor seasonal variations.

In December of 2013 the Parks and Recreation Department replaced their old infrared counters with newer, more reliable, and user-friendly counters. TRAFx was selected for its competitively priced infrared trail counter models that include a comprehensive online software package,

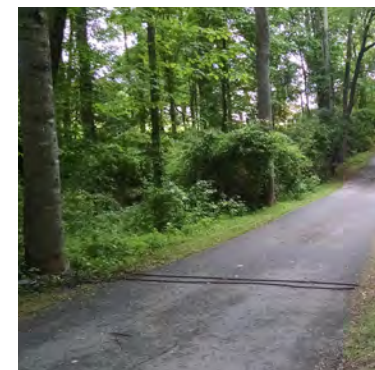
time of day records and improved body design to increase accuracy and weather resistance. These counters require one employee to manually visit each counter and upload the data. The data is then downloaded to the online data management system. Seven permanent counters have been installed on the greenway and trail system by the Parks and Recreation Department, which represents about 38% of the total MPO area system mileage. **Map 4-3** shows the location of the seven TRAFx counters. The counter system is not able to distinguish between bikes and pedestrians at this time. In order to differentiate between bicyclists and pedestrians, two different counters must be used: an infrared counter for pedestrians, and a loop detector or tube counter (similar to automobile counting devices) for bicyclists.



*Greensboro Parks & Recreation uses strategically placed counters along trails and greenways to keep track of bicycle and pedestrian traffic.*

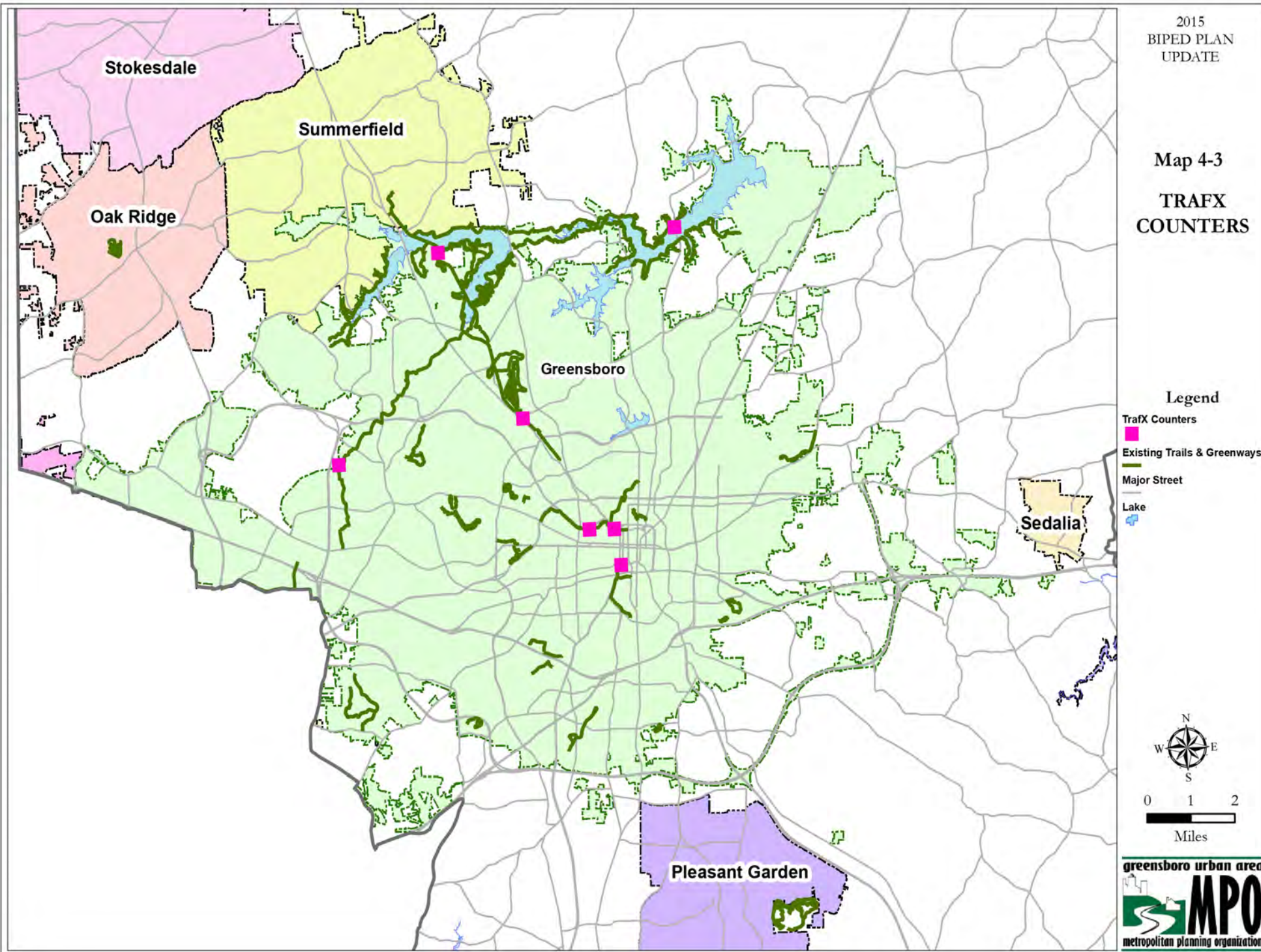
#### ***GDOT Counting Program***

GDOT's counting program was established to count bicyclists and pedestrians not just on streets and sidewalks but also on area greenways. To utilize resources efficiently, GDOT works cooperatively with the Greensboro Parks and Recreation Department to obtain traffic data that includes both bicyclists and pedestrians. GDOT uses pneumatic tube counters to count bicyclists on greenways. A tube is installed next to an infrared counter on a greenway so that data from these counters can be combined and so that pedestrians and bicyclists can be differentiated. Currently, GDOT changes counting locations on a monthly basis.



*Tube counter and TrafX counter on the A & Y Greenway at Bur-Mil Park to capture bicycle and pedestrian traffic.*

Map 4-3  
TRAFX  
COUNTERS





## NCDOT Bicycle and Pedestrian Counting Program

NCDOT selected the City of Greensboro as a pilot community for their permanent bicycle and pedestrian counting program for 2014-2016. The data gathered from the counting equipment will be used to develop factors and analyze patterns of bicycle and pedestrian travel in different spatial contexts. While several of the counters were located along roadways in downtown Greensboro and surrounding neighborhoods to capture urban travel, a counter was also placed on the Lake Daniel Greenway to collect off-road users. The equipment on the Lake Daniel Greenway is a Pyro Post combined with a ZELT Inductive Loop from the Eco Counter company. This equipment can collect and differentiate pedestrians and bicyclists in both directions.



*Permanent counters being installed on the Lake Daniel Greenway as part of the NCDOT Pilot Bicycle and Pedestrian Counting Program.*

### RECOMMENDATION

For increased efficiency, the trail counter system needs to be upgraded to a system for which the data is remotely accessible. This would allow for the count data to be sent via satellite to an online storage location that could be accessed by city staff from their offices. Although this is a more expensive system, it would reduce staff time dedicated to collecting data by eliminating the need for an employee to go out in the field to retrieve the data from the trail counter. This would free up time for staff to spend on important tasks such as analyzing the data and other priorities.

More counters need to be purchased to determine total system usage. As noted above, only 7 counters are active on the greenway and trail system at any one time, representing about 38% of the total MPO area system mileage (not including the new counter installed as part of the NCDOT Pilot Program). Having additional counters around the whole system will help with planning efforts for determining which trails and greenways are congested and in need of additional parallel facilities or additional

width. Also, a methodology and a set of factors need to be developed to derive average annual daily counts from permanent counting data. That will help to understand the trends and patterns in greenway usage and generate meaningful and comparable data from short term counting at various locations.

New counters must also distinguish between bicycles and pedestrians. It is important to understand the growth of bicycling travel along greenways to identify patterns of commuting and recreation. As on-road bicycling facilities are built near greenways, more bicyclists may begin to use the greenways and change the usage dynamic. More bicyclists may also lead to the planning of access points more suited to bicyclist and pedestrian usage.

Finally, it is recommended that permanent bicycle and pedestrian counters be installed with all new greenway or trail development. The cost of including permanent counters into greenway design and construction is very small compared to the overall cost of infrastructure improvements. Mobilization costs are also reduced because the counters are installed at the same time the facility is being constructed. The counters can provide data on greenway or trail usage immediately and demonstrate the success of the new facility.



*Bicyclists are counted by loop detectors in the pavement on the Lake Daniel Greenway.*

### IMPLEMENTATION

1. Continue the cooperation program between GDOT and Parks and Recreation to obtain trails & greenways counting data efficiently.
2. Continue to participate in the Permanent Counting Program with NCDOT for data collection and the development of seasonal and area type factors.
3. Procure funding to expand the Bicycle and Pedestrian Counting System on greenways and trails by 2018.
4. Install counters on new greenways, such as the Downtown Greenway, as they are built and as budget and timing allows.

## Maintenance

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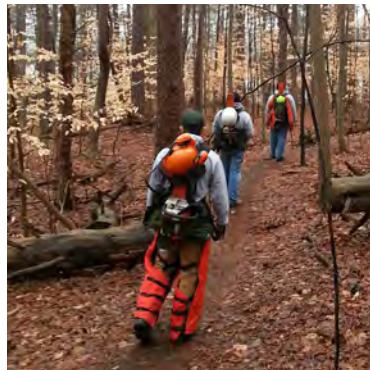
### Summary

In some ways greenway maintenance is similar to the maintenance of other bicycle and pedestrian facilities. Like sidewalks and on-road bicycle facilities, greenways need repair of damaged sections as needed and resurfacing at regular intervals. As with roadway environments, grasses and vegetation need trimming and site furnishings like trash cans and benches need to be maintained over time. Greenways have distinct maintenance challenges too though: features not commonly found in roadway environments such as public art, difficult to access locations, and extensive landscaping. Trails share these distinct challenges, though the maintenance of trails includes other challenges such as storm debris, water and user erosion, and rerouting.

The following section discusses existing maintenance practices, general conditions, and needs, followed by recommendations to improve greenway and trail maintenance and implementation goals.

### EXISTING CONDITIONS

The City of Greensboro's Parks and Recreation trail maintenance crew operates with one part time and three full time positions. An additional full time position was added to the maintenance staff in 2009 to keep up with growing demands and as recommended by the 2006 BiPed Plan. The maintenance crew is responsible for 30 miles of paved greenway and 53 miles of unpaved natural surface trails. This typically includes trails and greenways that fall outside of any park. Any trails/greenways that are completely within a regional park boundary are maintained by the corresponding park staff. • Guilford County has a small staff that does seasonal maintenance for various facilities around the county. Although it is not dedicated



*Removing storm debris such as downed trees is one aspect of trail maintenance.*

to trail maintenance, they do work on parks, preserves, trails, and greenways as needed.

The maintenance provided for the trail system by Greensboro Parks and Recreation staff primarily consists of ongoing, routine tasks such as trash pickup, vegetation management, leaf removal, and general safety checks. **Table 4.1** describes the general maintenance schedule of the trail maintenance staff. However, major maintenance



*Deteriorating pavement is a long-term maintenance concern for all greenways that must be addressed.*

items such as repaving or pavement repair are outside of the typical operating budget of the Parks and Recreation Department. The Parks and Recreation Department has not been successful over the years in getting such projects budgeted for funding under the Capital Improvements Program either. The Greensboro MPO helped plug this funding and maintenance gap in 2010 by directing funds towards resurfacing sections of two greenways. The City of Greensboro utilized \$224,136 in federal STP-DA funds from the MPO to resurface the A & Y Greenway from Pisgah Church Rd to the Guilford Courthouse National Military Park, and the Latham Park Greenway from Battleground Ave to Wendover Ave. A critical recommendation of this plan is that the City of Greensboro, and other MPO area jurisdictions, acknowledge and plan for future facility obsolescence and replacement. Like all capital facilities such items will deteriorate to the point of unusability without proper attention. Including a significant trail and greenway repair component in the next City transportation bond is recommended.

A related maintenance gap is the lack of a systematic maintenance conditions index for major maintenance issues like repaving and concrete repair. This conditions index would identify existing pavement conditions, for example, and help staff determine which greenways need repairs first or when a particular greenway may be due for repair. A conditions index would be a proactive step



to understanding and documenting the needs of these assets and help justify expending funds to address maintenance issues.

The implementation of the Downtown Greenway is also changing the amount and type of maintenance that is required by Greensboro trail and greenway maintenance staff. Not surprisingly, a mile of heavily landscaped and amenity laden paved greenway requires a substantially different approach in time required, expertise, and amount of money needed to maintain compared to a mile of natural surface trail. Contracted maintenance on a portion of the Downtown Greenway was implemented summer 2014 by the Greensboro Parks and Recreation Department. The estimated cost per year of the maintenance contract on 0.6 miles of the Downtown Greenway is \$20,000 due to its elaborate and large number of expansive landscaping elements. Using that estimate and applying it to the completed 4 mile loop would cost approximately \$160,000 per year. That number does not factor in the cost of maintaining expensive lighting, art and other site features. Volunteers have helped maintain a public orchard at the Tradition Cornerstone, installed in early 2014, which would have been challenging for existing staff to maintain based on current staff levels. The Downtown Greenway is also collecting funds for an endowment to help provide maintenance for the loop once it is completed.



*Innovative public art such as the Under. Over. Pass on the Downtown Greenway brings new greenway users but also new maintenance challenges.*



*Volunteers have been instrumental in the success of the public orchard at the Tradition Cornerstone.*

	DOWNTOWN GREENWAY	A&Y/ BICENTENNIAL GREENWAY	WATERSHED TRAILS
Trash	2x per week	Every 2-3 weeks	Trailheads: 2x per month
Mowing Weeding*	2x per week	Every 2-3 weeks	1x per month
Leaf Removal**	1-2x per week	1-2x per week	N/A
General Safety Checks	2x per week	Every 2-3 weeks	1x per month

\*Season: March-October

\*\*Season: October-January

**TABLE 4.1**

*Trails and Greenways undergo routine checks to these specifications.*

## RECOMMENDATIONS

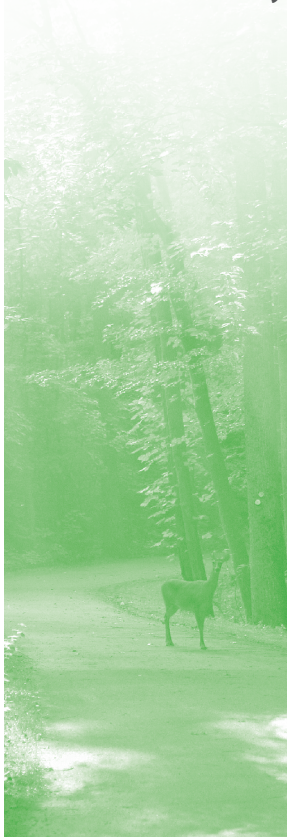
### Create Greenways and Trails Conditions Index

A new trail maintenance GIS layer should be created to tabulate trail and greenway conditions with point based data. Pavement conditions documentation would be a great resource for creating a repaving prioritization process. Other greenway conditions that could be included in the conditions index are bridge replacement/repair, greenway or trail crossing needs (such as additional signage, markings, or refuge areas), lighting, and locations of public art and other amenities. Besides the obvious benefits for determining routine and remedial maintenance, this index could be used to enhance marketing efforts by mapping locations of amenities for the public. It could also be used to plan for future amenities to be installed in underserved areas. This trails and greenways



*Undersized greenway bridges do not meet current standards and are barely wide enough for two pedestrians to pass each other comfortably.*

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data should also include facilities outside the City of Greensboro, including County and Town facilities. This will help provide a regional perspective on the needs around the entire MPO. Based on this index, a prioritized schedule for future improvement needs, including greenway resurfacing and trail development should be developed.

**Develop Trail Maintenance Handbook**

As trail maintenance becomes more complicated, especially in regards to maintaining new public art along facilities such as the Downtown Greenway, it will be necessary to document the procedures and protocols for future staff. The handbook should be a comprehensive document outlining all aspects of trail maintenance, including:

- A map and inventory of trail assets
- Landscaping diagrams and plant lists for existing beds
- Sample plans for bridges and overlooks or other site facilities that are built by staff
- Artwork maintenance specifications inventory
- Special event protocol (contracts for races and runs, rain closure guide, site prep)
- Memorandum of Understanding between City of Greensboro and non-profit Fat Tire Society (local mountain biking club) that outlines maintenance and construction guidelines

This information will make the handbook a vital tool for the Parks and Recreation Department. This plan recommends creating this handbook in a short-term timeframe after this plan is completed.

**Maintenance Staff Recommendation**

To adequately serve and maintain a safe and enjoyable future trail system in Greensboro, this plan recommends the addition of one full time or two part time trail maintenance positions for every 20 miles of additional trail/greenway. This represents a minimum practical standard; ideally staffing levels would be higher than that. As noted above, however, this recommendation must be

considered in light of what kinds of demands the new greenway/ trail would put on staff in regard to time and expertise required to maintain it. Based on the cost information highlighted above, it is recommended due to savings in expenses of equipment and employees that the City of Greensboro contract out maintenance of the Downtown Greenway as more segments are completed.

Similarly, Guilford County and the MPO Towns will need to add maintenance staff as the system is built out. As Summerfield continues to pursue the construction of the A & Y Greenway through the town, and the Piedmont Greenway develops east of Triad Park, maintenance must be planned for in advance and not as an afterthought. The County and Towns can use the minimum standard above as a reference for their own maintenance planning.

**Designate & Maintain Specific Greenways as Transportation Corridors**

The major greenway corridors are essentially streets on which access is limited to non-motorized transportation. The local paradigm needs to shift to that perspective. Greenways should be maintained on a level comparable with roadways. In order to accomplish this, the City of Greensboro and other local jurisdictions should dedicate funding in specifically for greenway resurfacing. Additionally, tracking greenway infrastructure

conditions including pavement conditions should become an ongoing responsibility for the appropriate maintenance officials. As noted in the bicycle chapter this will require specific capital budgeting requests and/or inclusion in the next bond referendum since street resurfacing budgets have been squeezed for years and do not have sufficient capacity as it is. The following existing corridors should be considered:



*Greenways provide transportation to key destinations for pedestrians and bicyclists, and should be treated as transportation corridors.*

1. A&Y Greenway
2. Bicentennial Greenway
3. Downtown Greenway
4. Latham Park & Lake Daniel Greenway
5. Northeast Community Trail

**Map 4-4** displays the locations and limits of the greenways listed above. Future greenways that are connective and transportation-oriented should be included once they become built, such as future segments of the N Buffalo and S Buffalo Creek Greenways.

## IMPLEMENTATION

### *Greenways and Trails Conditions Index*

The Parks and Recreation Department and the Greensboro Department of Transportation should work together to collect this information shortly after the **BiPed Plan Update** is completed. The goal should be to collect trail assets for a trail maintenance GIS layer by September 2016. This can be accomplished with current staff resources and in cooperation with the City's GIS Division. After this data is gathered, it should be kept up-to-date on an annual or semi-annual basis, depending on the completion of future projects.

### *Develop Trail Maintenance Handbook*

The Trail Maintenance Handbook should also be completed shortly after the conclusion of the **BiPed Plan Update**. The Parks and Recreation Department should consider this a priority project and develop it within 2016. Updates can be completed as necessary, such as for future public art installations on the Downtown Greenway and additional construction of the loop itself.

### *Greenways and Trails Maintenance Staff*

It will be necessary for the Greensboro Parks & Recreation Department to review its current maintenance staff levels and determine whether it is appropriate for the existing facilities within the City of Greensboro. It will also be important to strategize for the future, by considering the trails and greenways mileage that is expected to be built within the next five years, and determine whether new maintenance staff should be planned

for. Hiring new staff will require a service enhancement for the Parks and Recreation Department. However, as noted above, some maintenance – such as for the Downtown Greenway – could be contracted out. The maintenance fund for the Downtown Greenway will be another source of funds to draw upon, but other greenway facilities are unlikely to have this luxury.

It is important that Guilford County and the MPO Towns realize that funds must be set aside to provide for greenway and trail maintenance for upcoming projects that will be outside of dedicated parks. Although a small maintenance staff exists for the county, they will need to take a hard look at the maintenance needs arising from new facilities such as the Piedmont Greenway.

### *Designate Specific Greenways as Transportation Corridors*

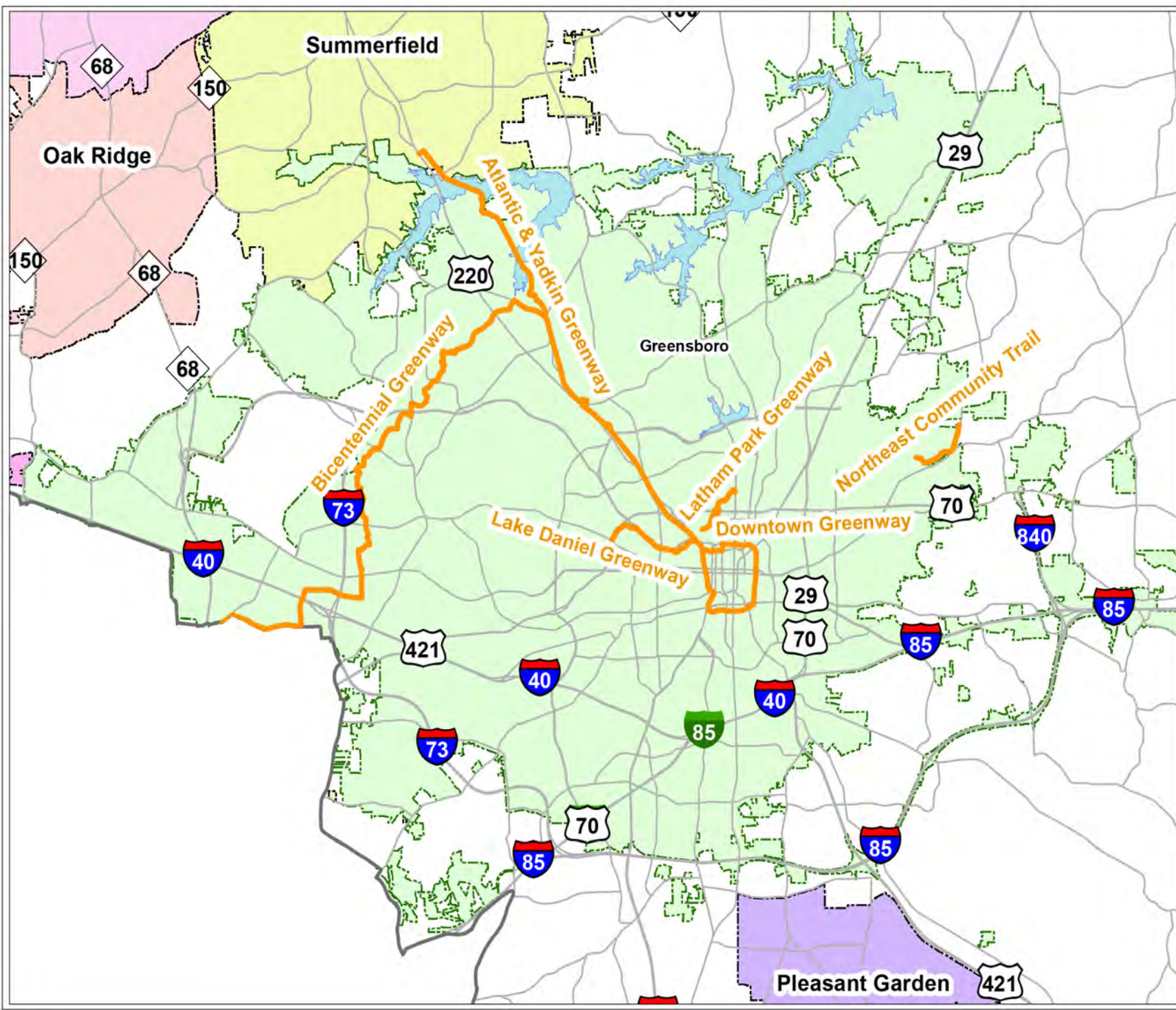
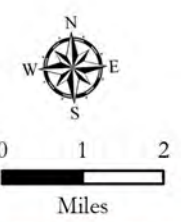
The greenways and trails noted under the **Recommendations** section already function as transportation corridors, but a designation will help give this issue further attention. The resurfacing budget as part of the next transportation bond should specifically include greenway resurfacing and accordingly be higher to accommodate greenway needs.



Map 4-4

DESIGNATE  
SPECIFIC  
GREENWAYS  
AS  
TRANSPORTATION  
CORRIDORS

- Legend
- Corridor
  - Major Street



## SAFETY

*The Pedestrian and Bicycle Chapters* focused on crashes generally related to automobile conflicts, since those chapters dealt with environments on-road or adjacent to the roadway. Off-road areas like greenways and trails have similar issues where they cross streets and driveways. They also can have issues with bicycle and pedestrian collisions. For urban greenways that may be used at night, lighting is necessary to facilitate continual usage and promote safety. On more remote trails, getting to users in case of emergency can prove difficult for first-responders. Protection against criminal activity is also a concern, although studies have shown that trails and greenways themselves do not generate crime. Regardless, perceptions of trail safety can influence trail and greenway use. Addressing concerns about crime and safety is very important to ensure that greenways and trails are safe and comfortable for everyone.

### Existing Conditions

The existing information provided below covers the City of Greensboro's efforts to ensure safety on its greenways and trails. These include analyzing bicycle and pedestrian crashes, making lighting improvements, installing emergency markers on the watershed trails, and providing police patrols to discourage criminal activity.



*Lighting is an important part of making greenways safe at all hours of the day.*

### BICYCLE AND PEDESTRIAN CRASHES

According to NCDOT Bicycle and Pedestrian Division, between 2007 and 2012 eight bicycle and pedestrian crashes occurred at seven locations where greenways and trails cross roadways. **Map 4-5** shows the locations of these eight crashes. Six of the crossing locations had one crash per location (either a bicycle or pedestrian crash), while the A&Y Greenway corridor between Cotswold Avenue and Cotswold Terrace had two crashes -- both bicycle crashes.

Seven out of these eight crashes resulted in evident injury. Four of these

crashes involved pedestrians and the other three were bicycle crashes. The remaining eighth crash was a possible injury that involved a bicyclist. Only one of the crashes (a pedestrian crash) occurred in hazardous weather conditions (snow and sleet). All of the other crashes occurred in clear weather.

Regarding all the crashes, the motorist groups with a higher percentage of involvement were white and female. Two of the drivers fled the scene, resulting in hit and run crashes. The most common contributing factor of these crashes was motorists failing to yield (37.5%). Drivers were found at fault in six of the eight crashes (75%). A bicyclist was cited for one crash and a pedestrian was cited for another crash.

The crash reports from the police department only record collisions between vehicles and pedestrians or vehicles and bicycles. However, collisions between bicyclists and other bicyclists, or between bicyclists and pedestrians, are very crucial to know about as well. Unfortunately, these categories of data are not available. To ensure safety and convenience for bicyclists and pedestrians on trails and greenways, these data should be monitored in the future to identify possible problems.

### LIGHTING

Lighting can be provided on greenways by lights installed specifically for that greenway, or by street lights that serve to illuminate nearby streets and sidewalks. Lighting facilitates and encourages use of greenways in otherwise low light conditions. This is partly a matter of usability, as lighting increases the ability of users to see the greenway and adjacent features. Additionally it is a matter of transportation safety: lighting enables users to see the greenway, each other, and potential trailside hazards. It is also a matter of security. By illuminating the vicinity of the greenway and the nearby shadows, security is demonstrably improved and users gain an added sense of safety.

The A&Y Greenway and the Downtown Greenway are so far the only greenways that have had lighting installed specifically to illuminate them. This has been done partly because the two greenways are considered transportation corridors – they are not simply recreational amenities but are intended to carry non-motorized traffic for commuting to work,



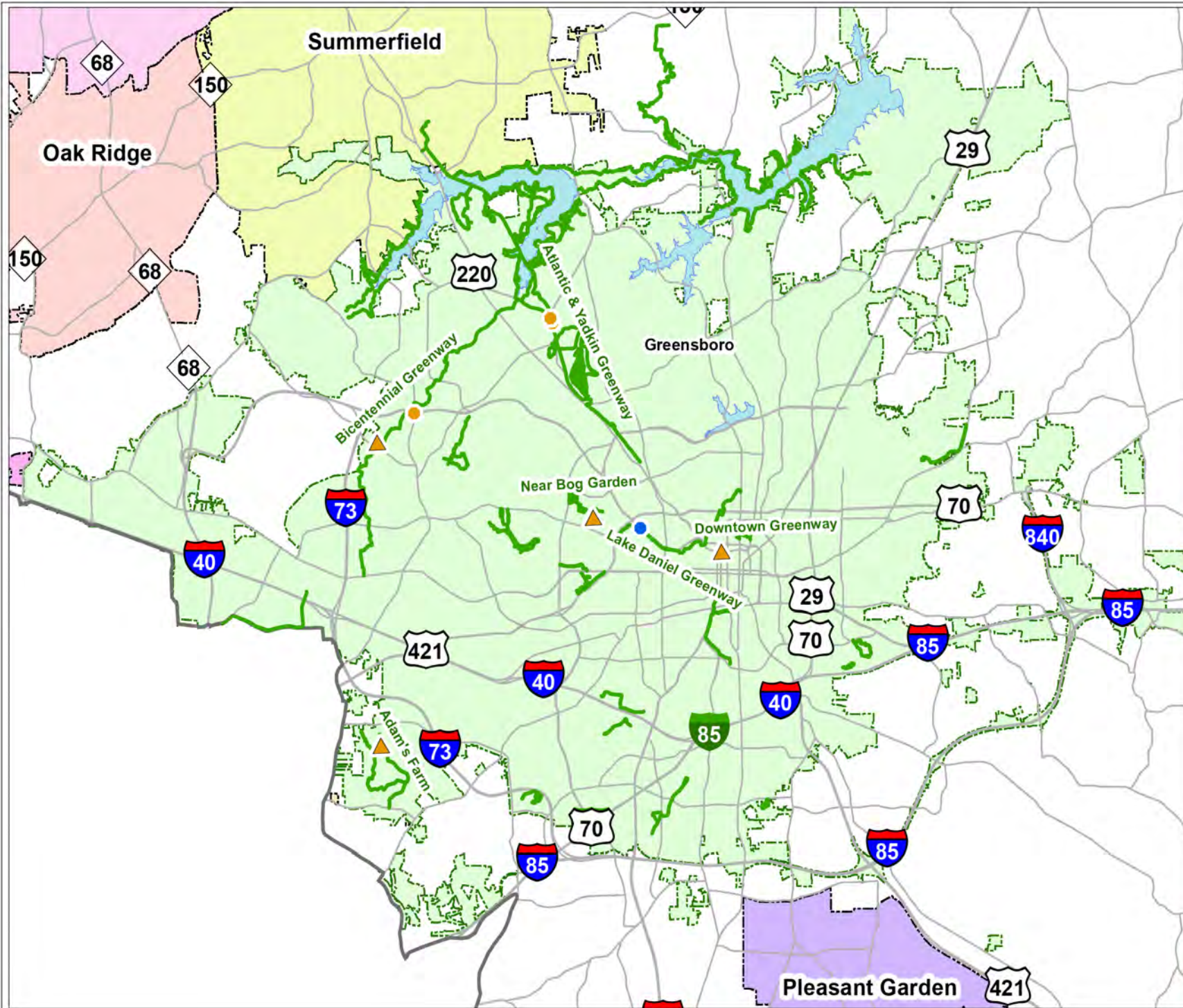
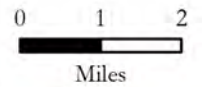
Map 4-5

CRASHES ON  
TRAILS &  
GREENWAYS

Legend

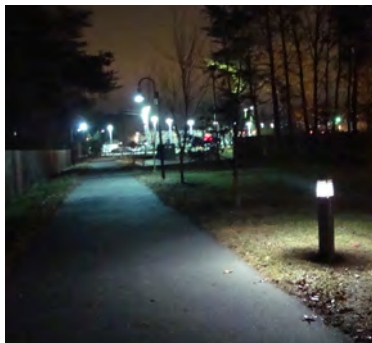
- Crash Type**
- Bicycle, Evident Injury
  - Bicycle, Possible Injury
  - ▲ Pedestrian, Evident Injury

- Existing Trails & GW**
- Major Street





running errands, and other uses. The A&Y Greenway between Markland Dr and Pisgah Church Rd was the first greenway to receive its own lighting. This includes bollards to provide “foot lighting” and traditional overhead lighting. The Downtown Greenway currently has only overhead lighting between Spring Garden St and Eugene St. This lighting is not shared with street lighting, although street lighting is used to illuminate greenway sections where it is possible to do so.



*Lighting along the A & Y Greenway allows it to be used after dark.*

As noted above, streetlights can be dual purpose to illuminate on-street facilities and adjacent greenways. Lighting from nearby streetlights is one strategy that GDOT uses to reduce costs of providing greenway-specific lighting. Streetlights can be placed such that they light sections of greenway at roadway crossings. The Southeast Greenway (Downtown Greenway to Randleman Road) and parts of the Bicentennial Greenway are two such greenways that are lighted in this manner. However, street lighting is often not enough to properly illuminate the majority of the greenway since it is only possible when the greenway crosses a roadway or travels along the roadway like a sidepath. Additional greenway-specific lighting is needed particularly on the Southeast Greenway.

Finally, different lighting types need to be considered. Although the majority of the street lighting and greenway lighting is metal-halide, the City of Greensboro is transitioning over to LED lighting for its street lights due to the increased lifespan, lower energy costs, and brighter light that LEDs allow. Greenway lighting may also be transitioned over to LED lighting because of these benefits, and new greenway lighting should take advantage of LED lighting as well.

### EMERGENCY MARKERS

The watershed trails are part of the Rescue Marker project. Those trails are located in the large buffer area of trees around the watershed lakes. These trails can be difficult for emergency response crews to

access. The Greensboro Parks and Recreation and Fire Departments, in collaboration with Guilford Metro 911, created a system to number the trails using GPS coordinates that pinpoint a trail user’s location. If a trail user were to sustain an injury they could use their cell phone to inform 911 which unique number they last saw on a rescue marker sign. EMS would then work in tandem with the first responders to determine the best point of entry to extract the injured person. To date about 75% of the watershed trails have been posted with rescue markers. **Map 4-6** shows the locations of rescue markers around the watershed trails. There are several other county parks and greenways that have also implemented a Rescue Marker project with local emergency responders.



*Rescue markers along the Osprey Trail along Lake Townsend help trail users identify their location if they are in an emergency.*

### PREVENTING CRIMINAL ACTIVITY

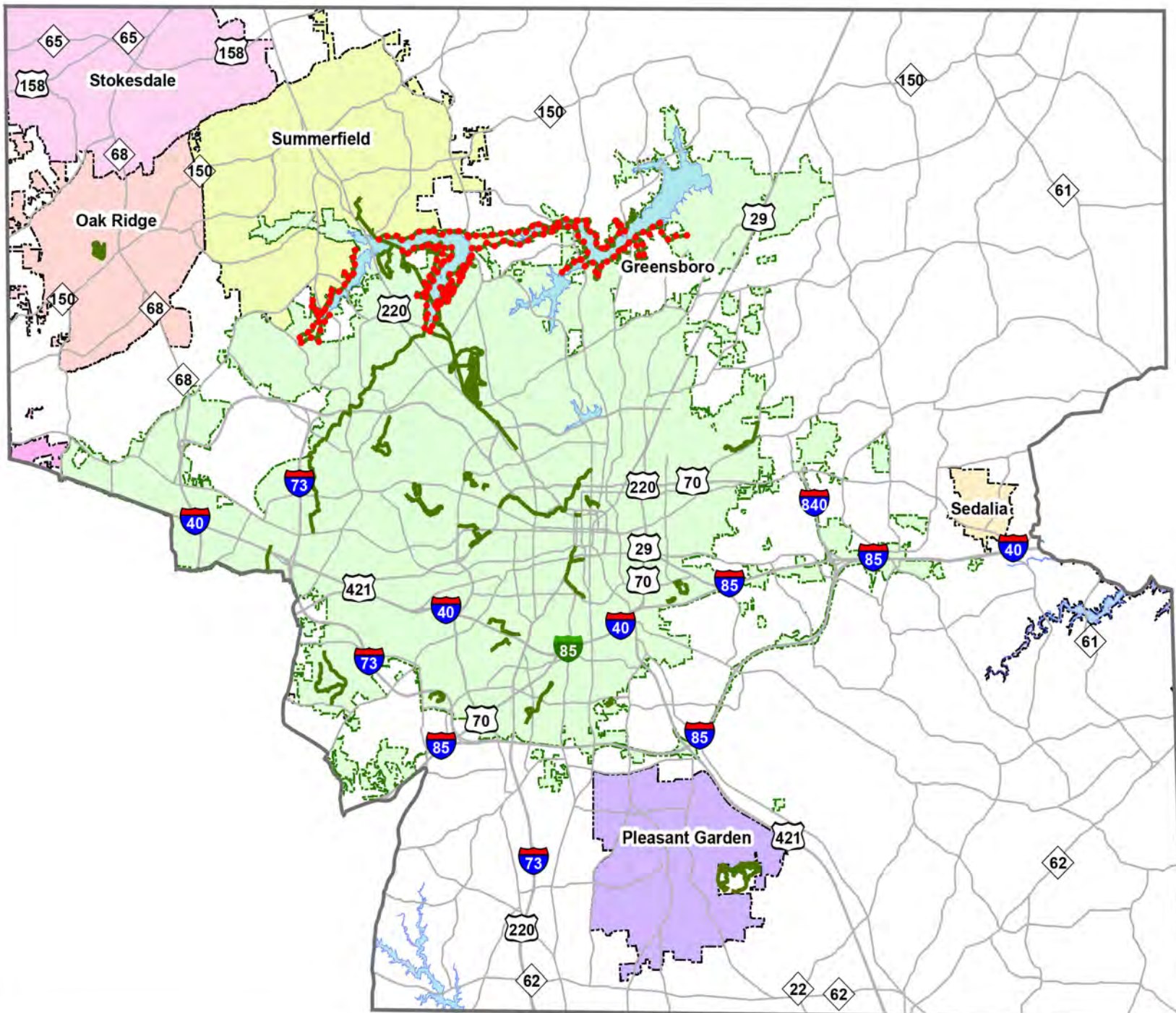
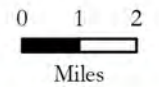
Criminal activities are a primary concern not only for people who want to use the existing trails and greenways, but also for the public and property owners in close proximity to proposed trails and greenways. Therefore, ensuring safety and preventing crime on trails and greenways are top priorities for communities and cities. The City of Greensboro manages more than 90 miles of trails and greenways. Since the Parks and Recreation Trails Section was created in 1997, there has been no serious crime on Greensboro’s trails and greenways. In a survey of 372 trails across the United States, the Rails to Trails Conservancy concluded that unsavory activity, vandalism, robbery, and violent crime rates on trails are much less common than in parking lots or public streets. Good trail design, trail patrols and higher trail use are great ways to further minimize undesirable behaviors. The greater the users and their frequency, the less conducive a greenway or trail environment is for unwanted activity.

In 2014 the City of Greensboro Police Department (GPD) increased the number of police patrolling communities on bicycles. This was part of an

Map 4-6  
**CURRENT  
RESCUE  
MARKERS**

**Legend**

- Rescue Markers
- Existing Trails & Greenways





effort on their part to further reduce crime and be more approachable to the public. These “bike patrol officers” receive specialized training and gear. This also allows for them to have better access to urban greenways that may be out of sight of normal vehicle traffic. GPD even offers a “Bicycle Ride-Along” where residents can join a police officer on a bike to observe police work first hand. Greensboro Parks and Recreation has encouraged GPD to increase their presence on urban greenways to help dissuade graffiti, vandalism and loitering.



*Participants in the Greensboro Police Department's first bicycle ride-along training on the Downtown Greenway.*

In Greensboro when vandalism or graffiti occurs, it is repaired or removed as quickly as possible. Greensboro Parks and Recreation utilizes “flash-cams” in pop-up problem areas. These flash-cams operate dawn to dusk and warn people in the area after posted hours that they need to leave or their photo will be taken and sent to police. Keeping trails and greenways actively monitored in these ways helps ensure our network of paths has a reputation as a safe place.



*Graffiti is removed as soon as possible from the greenways, especially when it is done in a profligate manner, such as on this greenway bridge.*

**Crime Prevention through Environmental Design** (CPTED) is a multi-disciplinary approach to deter crime through environmental design. CPTED strategies rely upon the ability to influence offender decisions that precede criminal acts by affecting the built, social, and administrative environment. CPTED strategies can attempt to deter criminal activities, increase overall safety for trail and greenway users, and reduce fear of crime on trails and greenways. Six key components of CPTED that can be applied to reduce crime on trails and greenways include:

- **Territoriality:** promotes a sense of ownership and conveys a message that “the owner cares and protects the property”, such as installing signs, fences, artwork, or landscape to clearly delineate between public and private property.
- **Activity Support:** encourages legitimate activities to promote the presence of users on trails and greenways, such as organizing block parties or neighborhood clean-up days.
- **Natural Access Control:** restricts access to specific areas, and avoids or decreases criminal accessibility. An example is using a highly visible gate or entry way that all people should enter the facility, or closing gates at night time in locations where trails and greenways are unsafe or lack lighting.
- **Natural Surveillance:** maximizes visibility and minimizes hidden and isolated areas. For example, restrooms, play areas, picnic areas, trailheads, and parking lots should be placed near streets and other activity centers so they are easily seen.
- **Maintenance:** routine maintenance keeps the trails and greenways clean and safe, such as keeping brush and trees low so no one can hide in it, removing gang graffiti as quickly as possible, and maintaining landscaping and lighting.
- **Target Hardening:** adding physical features that make it more difficult to commit a crime, such as improving lighting or avoiding creating spaces that people can hide.

The City of Greensboro has applied CPTED principles throughout Greensboro, such as trimming trees and shrubs to improve visibility along corridors, putting rails on top of walls, and making benches too short to lie on. Other examples include the GPD “Bicycle Ride-Along” program and how Greensboro Parks & Recreation attempts to remove graffiti as soon as possible. Still, principles of CPTED should be reviewed and applied systematically and officially in designing and operating trails and greenways to ensure safety and comfort while discouraging potential criminals.

- Introduction
- Infrastructure
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- Recommendations
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## Recommendations

**1. Bicycle and Pedestrian Crashes:** Improve the safety of crossings for bicyclists and pedestrians, such as installing RRFBs, signs, and high visibility crosswalks. In addition, monitor reports of bicycle-on-bicycle and bicycle-on-pedestrian crashes as they arise to determine safety countermeasures as needed.



*Crossing improvements at trail and greenway crossings require several elements, including signals, signs, high-visibility crosswalks and medians.*

- 2. Lighting:** Future greenways designated as “transportation corridors” should generally receive lighting. The preferred type would be solar powered foot lights for easily accessible maintenance and lower light pollution levels in areas where it is feasible.
- 3. Emergency Markers:** Expand the Rescue Marker project to new trails around city lakes and greenways. Limit expansion to include only remote areas that are more difficult for first responders to access via the street network.
- 4. Preventing Criminal Activity:** Regular patrolling on urban greenways by police officers is a necessity. The presence of police improves safety and reduces the likelihood of crime and vandalism in these areas. As the greenway and trail system grows this need will only increase. Additionally it is recommended to involve the Police when new trails and greenways are added to the system to help with overall awareness of potential problem areas. Principles of CPTED should be reviewed and applied by local governments in the design and construction of future greenway facilities.

## Implementation

- 1. Review existing greenway and trail road crossings to ensure that all needed safety measures are being taken. This should be completed in the short term, 2016-2017, so that improvements can be coordinated in a timely manner. In addition, GDOT and Parks and Recreation should work with GPD and emergency responders to review the causes of crashes along trails and greenways if and when they occur. This is an ongoing coordination effort.
- 2. Develop a lighting plan for greenways that are designated as transportation corridors. This plan should weigh the costs and benefits of installing greenway lighting along different corridors and identify strategies to fund and maintain an expanded system. This should be completed by the end of 2016.
- 3. Establish a yearly committee with representatives from Parks and Recreation, Fire, EMS911 and Police to maintain oversight and growth of the Rescue Marker project by the end of 2016.
- 4. Partner with Greensboro Police to include regular police patrol of urban and rural greenways as part of general patrolling routes by 2018. In addition, the principles of CPTED should be considered for all future trail and greenway projects.



## POLICIES AND PROGRAMS

*The Bicycle and Pedestrian Chapters* noted that infrastructure improvements are essential but not the only relevant elements to supporting bikable and walkable communities. Similarly, greenways and trails have supporting policies and programs that provide for enhanced maintenance of the system, ensure proper development near trails and/or greenways, and celebrate the network. They help engage the public with the greenway and trail network and become invested in the sustainability of its function and expansion. The policies help guide greenway and trail development for the long term.

### Policies for Design and Developments Adjacent to Greenways

The design of developments adjacent to greenways may have the same elements as those discussed in the *Pedestrian Chapter* that are necessary for pedestrian-supportive land use: mixing land uses; clustering development; promoting higher density near commercial centers, transit service, and community facilities; appropriate pedestrian scale; and other elements (see *Supporting Policies and Programs* in the *Pedestrian Chapter* for a more detailed discussion). While greenways are multi-use, non-motorized users including pedestrians, bicyclists,

skaters, and others all benefit from pedestrian-supportive development. In addition, developments should be oriented to the greenway facility and treat it as an amenity and asset. It is a transportation corridor that can bring users to public spaces, community facilities, commercial centers, or other attractive areas just as well as a regular street. To that end this plan recommends that the City of Greensboro and other MPO jurisdictions develop design guidelines for developments adjacent to greenways to ensure that pedestrian-supportive design is included in the development.

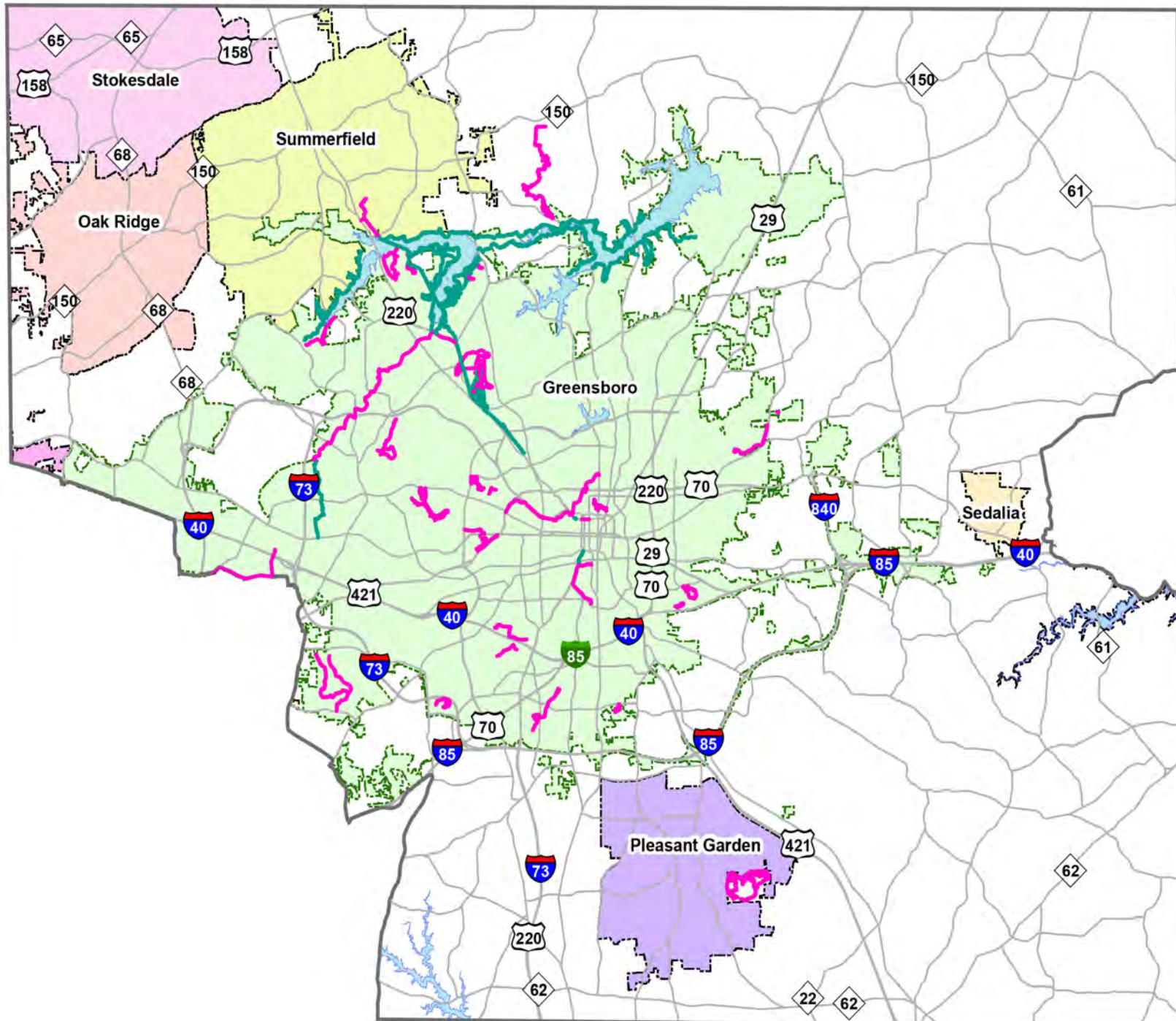
The City of Greensboro updated its Land Development Ordinance (LDO) in May 2013 to better accommodate and regulate developments adjacent to greenways, although it does not speak directly to the design and form of adjacent structures. The changes to the LDO included introducing language on setbacks in reference to existing or planned greenways, reductions in parking ratios and requirements for bicycling parking for uses directly accessible to existing or planned greenways, and references to signage oriented towards existing or planned greenways. This is a good start for enhancing the relationship between land development and existing and future greenways, but as noted above, more could be done to create greenway-oriented developments.

*Participants at the 2015 National Trails Day in Country Park.*





Map 4-7  
**GREENSBORO  
ADOPT-A-TRAIL  
MAP**



- Legend
- Adopted Trails
  - Trails Waiting to be Adopted
  - Major Street
  - Lake

Source:  
Greensboro  
Parks & Recreation





## Programs and Partnerships to Assist With Maintenance of Trails and Greenways

A considerable amount of trail maintenance is performed by the Greensboro Parks & Recreation Department's trail maintenance staff. However, the greenway and trail network is substantial and it is a tall task to maintain the entire network effectively with such a short staffed operation. The following programs provide additional greenway and trail maintenance by dedicated individuals, organizations, and advocates that care deeply about keeping the facilities clean and inviting to all users.

### ADOPT-A-TRAIL PROGRAM

Groups, student organizations, businesses, or families can volunteer their time throughout the year by caring for an adopted trail. Adopting groups commit for two years and provide at least three work days annually on their adopted trails. Volunteers have put in thousands of hours of maintenance time over the years to keep the trails beautiful for all residents and visitors. **Map 4-7** displays the locations of currently adopted trails and additional trails around the MPO that could benefit from being adopted. This plan recommends Greensboro Parks and Recreation continue this program and expand it as possible to reduce the burden on current maintenance staff. It is also recommended that Guilford County and the MPO Towns consider using this model as a way to supplement existing and future maintenance programs. However it should not be relied upon as the main component of a maintenance program, which will still require local funding and staffing.



*Many of the adopted trails are mountain biking trails that draw enthusiasts from the around the region and are well maintained.*

## GREENSBORO FAT TIRE SOCIETY

The Greensboro Fat Tire Society (GFTS), the local mountain biking club and chartered chapter of the International Mountain Biking Association (IMBA), has maintained a partnership with Greensboro Parks and Recreation as well as Guilford County since 1995 to help build and maintain the mountain biking trails throughout the MPO. Volunteers from GFTS have collectively spent thousands of hours maintaining mountain biking trails, building bridges, removing downed trees, rerouting trails when needed and coordinating signage. The GFTS and their volunteers have been invaluable to the community and made Greensboro a draw to hundreds of mountain bikers in the Triad area and beyond.

It is recommended that the Greensboro Parks and Recreation Department develop a Memorandum of Understanding between itself and the GFTS. This will help guide the relationship between the non-profit and the City and solidify the responsibilities of each party.



*The Greensboro Fat Tire Society has been an excellent advocate and City partner in maintaining and constructing mountain biking trails.*

## Promotional and Encouragement Programs

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It is important to celebrate and promote the greenways and trails to give the public first-hand experiences with using these facilities.

These experiences help generate volunteers and advocates for the network and help them recognize what valuable assets they are for the community. The Greensboro Parks and Recreation Department runs various events and activities throughout the year, but there are a few events that stand out for their size and scope in promoting a wide range of activities on the trails and greenways.

### NATIONAL TRAILS DAY

The *American Hiking Society's National Trails Day* is an annual event that takes place on the first Saturday in June. It is a celebration of trails with family-friendly events including hiking, biking, horseback rides, paddling trips, geocaching, gear demonstrations, stewardship projects and other programs. In 2014, more than 144,000 people participated in over 2,000 events around the country. The City of Greensboro Parks and Recreation Department has been celebrating National Trails Day since 1998. Greensboro's event has had thousands of attendees throughout the years for many activities, including: guided hikes, guided mountain bike rides, skills workshops, kayak and paddle boarding demos, volunteer projects, live music, free giveaways, food trucks and more! This event brings people together on trails and greenways and provides a fun and social way for them to experience them.

This is a very large event for the Parks and Recreation Department and should continue to be celebrated in the future.



*National Trails Day includes programs for children to get them out on trails and interacting with nature.*

For more information on National Trails Day, visit <http://www.americanhiking.org/national-trails-day/>.

### NATIONAL BIKE MONTH

The League of American Bicyclists has designated May as Bike Month since 1956. The event is an opportunity to promote the benefits of biking in all its forms, whether for commuting to work and school, running errands, or for pleasure and recreation. The Greensboro MPO and the City of Greensboro have celebrated Bike Month since 2007. Bike Month is an opportunity to enjoy bicycling on the trails and greenways throughout the MPO area, engaging residents and encouraging them to experience these facilities.

More information about Bike Month can be found in the **Policies and Programs Section** of the **Bicycle Chapter**. However, it is recommended that Bike Month continue to include events related to greenways and trails since they are important pieces of the bicycle network.

### PARKS AND RECREATION MONTH

National Park and Recreation month has been celebrated by the National Recreation and Park Association in July since 1985. The City of Greensboro's Parks and Recreation Department has been celebrating Park and Recreation Month since 2013. The month of July features a calendar full of events to encourage people to get outdoors and use their local parks, trails, and recreation facilities. Residents can earn prizes and win gift certificates for various programs and facilities as part of the department's drive to encourage residents to enjoy and support the recreational amenities that trails, greenways and parks provide.

It is recommended that the Parks and Recreation Department continue to support this event and tie-in existing programmatic elements with it. It is also recommended that Guilford County Parks involve themselves with Parks and Recreation Month as possible, and coordinate with Greensboro Parks and Recreation to develop an MPO-wide program.



## Mapping and Wayfinding Programs

Residents and visitors need to have resources to find their way around the trail and greenway network, whether they are looking on a computer, on their phone, on a paper map, or as they are traveling along a facility. Maps in all forms are essential to help users plan their trip and find the closest access point for the facility they want to use. Wayfinding refers to the signs and guidance that users see on the facility to direct them along their path and provide information for their visit.

### MAPS AND MOBILE APPLICATIONS

Maps may come in many forms – online, on paper, and on mobile devices. While some users may still prefer paper maps, other users are comfortable using online and mobile mapping programs. In 2014 the Greensboro Parks and Recreation Department produced a new map of the Watershed Trails and included connections to the A&Y Greenway and the Bicentennial Greenway. The map provides locations of parking facilities, public marinas, trail and greenway mileage information, as well as phone numbers and websites. This map can be found online at [www.greensborotrails.org](http://www.greensborotrails.org) as well as in print format at various locations such as bicycle shops and outdoor retailers.

However, residents and visitors need a central place where they can easily view the trails system across city and county boundaries. The Watershed Trails map does not include other areas of the city or possible connections to trails outside of the city. The City of Greensboro and Guilford County are currently working to merge all trail and greenway data. This will begin in an online mapping application giving users an interactive experience with relative trail data and Google Map directions to the trailheads. A GPS based mobile application used for navigating the trails in the MPO would be the ultimate goal of the project. A survey was conducted in 2013 to poll Greensboro trail users if having a mobile phone trails application would be beneficial to them. The responders were overwhelmingly in favor of having the app and a majority also indicated it would make them feel safer when using the trail system.

This plan recommends that an online mapping application and eventually a mobile application be developed for the trails and greenways system

within the MPO area. This could also be integrated with sidewalk and bicycle facility data to create a complete picture of all the non-motorized facilities within the MPO area. Creating this database and mapping program could be done in tandem with the greenway and trail condition index as recommended in the Maintenance Section of this chapter. It is also recommended that print maps still be made available, although in more limited amounts. Ideally more people will switch to online or mobile mapping and get the most up-to-date information whenever they review the map.

### WAYFINDING AND SIGNAGE GUIDELINES

Clear and consistent wayfinding and signage helps users understand where they are within the trail and greenway system and gives them the necessary information to get where they need to go. It can also be used as a marketing and promotional tool that identifies the system as a unique and interesting asset that is unlike other greenway and trail systems. Unfortunately, the greenway and trail system in the City of Greensboro does not have consistent signage and different greenway segments that have been developed at different times may have little in common and may not provide proper guidance to other facilities in the system. In order to correct this, sign design standards and wayfinding guidelines should be introduced to help orient users of the system.



Appropriate facility design standards must be observed for trails, greenways and sidewalk connectors. A design manual for natural surface trails includes the “Trail Solutions Handbook: IMBA’s Guide to Building Sweet Singletrack”. This guide is a compilation of proven methods and current trends aimed at providing sustainable trail building techniques. Design standards for greenway corridors include the American Association of State Highway Transportation Officials’ (AASHTO) Guide for the Development of Bicycle Facilities – Fourth Edition. These manuals are a good place to start when determining standards for the City to

follow. These standards should be determined and implemented in 2016.

collection of paths. These guidelines would allow for nuances between paved and natural surface paths and could be derived from two sources: IMBA's Sign Guidelines in Chapter 9 of "Managing Mountain Biking"; and the Manual on Uniform Traffic Control Devices (MUTCD: Chapter 9, Traffic Control for Bicycle Facilities). Similarly to the design standards, these wayfinding guidelines should be created and implemented in 2016.

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Additionally, the trail and greenway system is in need of standardized wayfinding and route identification signage guidelines. This would allow for there to be a consistent and reliable transfer of information regarding distances, linkages and navigability to the users. This would also help users identify the system as an interconnected whole rather than a piecemeal



Standardized and clear wayfinding signage helps users find their way around the trail system and passively promotes it.