# Contents

# 1.0 Introduction

View along Ogle Road looking West

Gatlinburg, Tennessee, is one of the primary gateway communities to the Great Smoky Mountains National Park, the most visited national park in the country. The city's main corridor (U.S. 441 or Parkway) leads to the park and is lined with retail shopping, motels/hotels, restaurants, theaters, and recreational facilities that are heavily visited by tourists. Tourism is Sevier County's major industry and has helped to promote economic growth; however, it has also led to traffic congestion and pedestrian/vehicular conflicts. To address the demands that have been placed on the transportation system, and to enhance the recreational opportunities for its residents, the City of Gatlinburg has initiated this greenway study to ensure the vitality of the Gatlinburg community as a residence and tourist destination.

In July of 2009, Barge Waggoner, Sumner and Cannon, Inc., (BWSC) was retained to prepare a greenways master plan for the City of Gatlinburg. The purpose of this report is to document the process that was used to provide a proposed greenway network, that not only connects residents and visitors of Gatlinburg to the businesses that are dependent on their support, but also fosters the connection of the community to itself.

A greenway is defined as a linear corridor of open space along waterways, ridgelines, railroad, road, and/or utility corridors that connect recreational, cultural, and natural areas. Greenways usually consist of some type of trail, either paved or unpaved, that can be used by walkers/joggers and bicyclists either for alternative means of transportation or for recreation. In addition to providing routes for non-vehicular traffic, greenways are often used to preserve open space along a stream or some other natural area. Having greenways in these locations serves to protect habitat for plant and animal life and can also protect water quality by providing a buffer that prevents sediments, toxins, and nutrients from entering a stream channel. Other primary benefits of greenways include enhancement of (1) property values, (2) sense of community, and (3) transportation efficiency.

The Gatlinburg Greenways Master Plan provides for the City a document that identifies the processes used, the influential factors, and conceptual design recommendations for the development of a city-wide greenway master plan. Phasing recommendations and preliminary budgets round out the plan, giving the City of Gatlinburg a realistic basis for moving forward in its environmental and urban improvements.

This Master Plan was developed from two primary sources: 1) the inventory and analysis of technical information for the project area and 2) the input from community leaders and interested residents. The recommendations reflect a synthesis of community desires, natural and man-made influences, and technical greenway system standards. The result is a plan from which the citizens of Gatlinburg can systematically develop a city-wide greenway system that will be an important link in the regional greenway system. This greenway system will become a source of community pride, promoting economic development and improving the living conditions for local residents and tourists.

## 1.1 MASTER PLANNING PROCESS

The planning process consisted of three basic components: GIS data collected from the city staff, aerial photography, and field / site visits. A preliminary greenway master plan was prepared, with various segments connecting areas of interest within Gatlinburg city limits. A public meeting was held to collect responses from Gatlinburg residents. Revisions were made to the greenway master plan based on public feedback, and a final master plan was presented during a second public meeting which included cost and phasing recommendations, as well as standard greenway construction details as required by grant funding agencies.

This master plan is a conceptual look at potential greenway routes. Although each proposed route has been reviewed to determine its feasibility, there are many detailed design, engineering, and right-of-way acquisition issues that must be resolved before any route can ultimately be built. Therefore, this study should be viewed as a conceptual framework for the future detailed planning, design, and implementation of the greenway system.

## 1.2 BENEFITS AND OPPORTUNITIES OF GREENWAYS

One of the top tourist destinations in the state, Gatlinburg and the Great Smoky Mountain National Park (GSMNP) attracts visitors from around the world. Known for its scenic atmosphere, Gatlinburg is host to unique shopping, dining, and recreational amenities. As seasonal vehicular congestion creates a host of negative environmental impacts, the greenways serve as an alternate form of transportation for citizens and tourists alike. As pedestrians travel the connected system of trails from residential districts to commercial hubs, increased interaction with local merchants has been proven to increase sales along greenway corridors.

Studies show that walkers have fewer incidences of cancer, heart disease, stroke, diabetes, and other fatal diseases. Tennessee, ranked 48th in overall health, has roughly 62% of the population considered overweight, and 30% experiencing no physical activity at all.

Greenways also have been proven to enhance property values, and decrease criminal activity in remote areas. Homes bordering the 12-mile Burke Gilman trail in Seattle, Washington, sold for 6% more than the homes of comparable size that didn't have close access to the greenway. Between 1980 and 1990, the percentage of Denver residents who said they would pay more to live near a greenway rose from 16% to 48%. Also, property values along a greenway increased enough to generate $500,000 in additional property taxes, paying for the greenway in 3 years. The Creeper Trail in Virginia generates over $1.6 million each year in direct expenditures, while providing a safe form of recreation for its tourists. In Mecklenburg County, North Carolina, a study found that the incidence of crime along the Mallard Creek Greenway was half that of the surrounding police district. Furthermore, greenways have been the catalyst for historic preservation in many communities. In some cases, sensitive environmental areas are highlighted through the introduction of a trail system. With the addition of educational signage, greenways allow trail users to interact with the ecological forces acting on their habitat.

# 2.0 Inventory and Analysis

The physical boundaries of the study area lie within the Gatlinburg City Limits, The Great Smoky Mountain National Park to the north and south, Buckhorn Road to the east, and the Parkway bypass to the west.

The first step in the inventory phase was to obtain maps and aerial photos of the project area. Maps provided the locations of all roadways and associated right of way, parcels, streams, rivers, and surrounding mountains. A field reconnaissance was conducted to review potential routes using a vehicle and/or where possible on foot to determine the conceptual feasibility of potential trail routes. Due to private property ownership issues, a complete field review of each entire route was not possible; however, adequate photography and information was obtained to perform the inventory.

After field information was obtained, a top level analysis of natural and cultural features, transportation resources, and existing and future connection points was performed. This analysis determined which areas of features could provide opportunities or constraints to development of a greenway system and amenities. Identification of these opportunities and constraints guides the design of the greenway master plan by acknowledging those elements that could influence, either positively or negatively, the routing and design of the system in its preliminary stages.

This section also provides some general guidance and information regarding trail design and permitting issues that will require attention / resolution during the detailed planning and design process.

## 2.1 NATURAL SYSTEMS

View of tributary to East Prong Bird Creek

The natural landscape of Gatlinburg is characterized by narrow stream valleys and steep mountain ridges. Areas of more favorable topography were previously farm land and have since been densely developed. The east end of Gatlinburg, in the area bound by Highway 321, Buckhorn, Proffitt, and Glades Road, is the most gently rolling and open. Meadows and stream tributaries create a network of linear corridors that wind through the sparsely populated farmland, eventually leading to the West Prong of the Little Pigeon River. ***Figure 1.0*** shows the natural features that will influence trail design and location.

### 2.1.1 Vegetation

A majority of the tree species are typical of the Cove Hardwood Forests. Hemlock forests often grow along stream banks, where water temperatures typically remain cold year-round. Hemlocks survive better than most species in this cool, damp air. The hemlock woolly adelgid, an insect that threatens the survival of hemlocks in the eastern United States, also thrives in this diverse ecosystem. Other important tree species include tulip poplars, American basswood, red maple, sweet gum, yellow buckeye, black birch, and dogwoods.

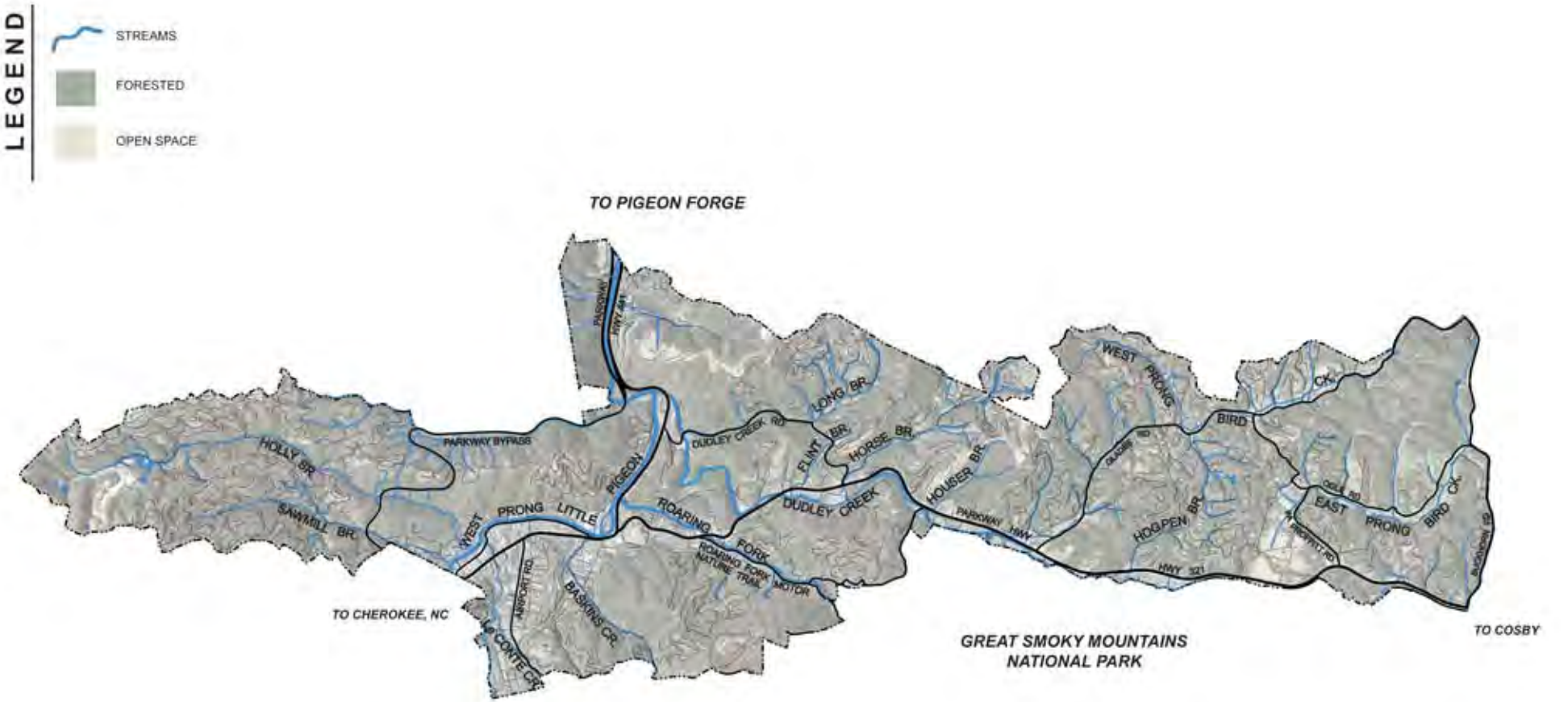



FIGURE 1.0

NATURAL FEATURES

# GATLINBURG GREENWAY MASTER PLAN

GATLINBURG, TENNESSEE

JUNE 2010

### 2.1.2 Topography

Topographic conditions are one of the most important elements that influence trail construction in terms of routing and cost. The trail should "follow the contours" where possible to minimize the longitudinal slope of the trail and lessen cost by reducing the amount of grading required. Careful consideration should be given to the amount of surface drainage which could flow across the trail route and appropriate drainage features should be installed accordingly.

Most areas within Gatlinburg are characteristic of the Appalachian mountain region, narrow stream corridors draining steep vegetated slopes. As expected, the majority of urban development is found in the level floodplain areas of the West Prong Little Pigeon River along U.S. 441. The steeper slopes outside the urban core provide unique challenges for greenway development.

### 2.1.3 Streams

View of LeConte Creek

Stream crossings are one of the most challenging and costly parts of trail planning and construction. If there are streams along the route that appear as "blue lines" on a United States Geological Survey (USGS) map, and if there is flowing water in the channel, the stream is likely regulated by the U.S. Army Corps of Engineers (COE) and/or TDEC. However, not all "blue lines" are regulated streams and there could be regulated streams that do not appear as a "blue line". A consultant familiar with the federal and state regulations and/or a representative of COE or TDEC should therefore inspect any suspected streams where greenway trails are planned. Any crossings of and/or modifications to regulated streams and potentially to adjacent vegetation require a permit from COE and/or TDEC.

The design of any stream or drainage channel crossing requires special design expertise. Any such crossing with a paved trail should be designed by a licensed professional. The design of small foot bridges for primitive trails is simpler; however, spans over 4 feet should be reviewed by a licensed professional. The project area contains numerous creeks, streams and seeps. These features also offer unique challenges, but also prime opportunities for greenway development. Routing of a trail along streams provides one of the best trail user experience.

### 2.1.4 Special Natural Features

Rock outcrops and possible wetlands in low-lying areas and along streams are special natural features that occur in the project area. Wetlands present special challenges. Not all wetlands have been mapped and identified on National Wetland Inventory Maps, so identification may be difficult. If any area along the route has standing water, appears "boggy", and/or is very soft underfoot (not all wetlands have cattails), a professional, the COE, and/or TDEC should be consulted. Also, natural overlooks provide highly desirable nodes making the trail network more interesting and uniquely Gatlinburg.

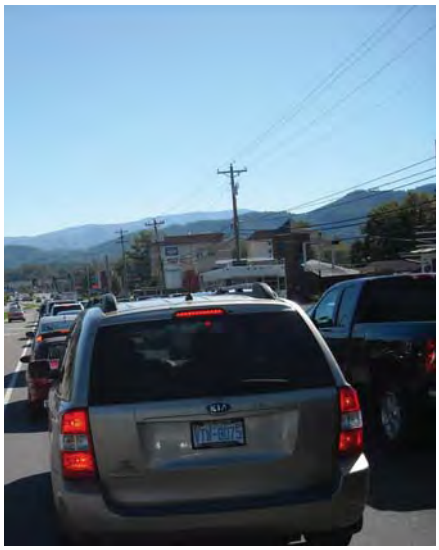
## 2.2 CULTURAL SYSTEMS

Gatlinburg is a top tourist destination in the state. Although it only has a permanent population of approximately 3,500 residents, the infrastructure

supports a nightly population of over 40,000. The transportation network and tourism-based businesses are heavily developed to serve a large percentage of the 10 million visitors that travel to the GSMNP annually. The inventory of the cultural systems is important to identify because the connectivity within the greenway network needs to serve dense tourism developments, publicly owned facilities, parks, transportation resources, and residential neighborhoods. ***Figure 2.0*** depicts the various cultural features influenced the greenway trail routing.

### 2.2.1 Transportation Networks

Road and driveway intersections present the most dangerous trail planning condition. Alternative measures (over- or underpasses) that eliminate the need for trail crossings of roadways should be used where possible. At grade road crossings should ideally be located at signalized intersections; four way stop intersections would be the second choice. Mid-block crossings should only be considered on low traffic volume and low speed roadways that provide excellent visibility in both directions from the crossings. However, mid-block crossings should be avoided if at all possible.



Congestion on Highway 441

Crossings should be made at a ninety degree angle where possible; special pavement markings and signage are necessary. Sight distance at crossings for the trail users and the vehicles is especially critical. Because of the critical need for safety, a professional should be consulted before constructing any road crossing.

Highway 441 (Parkway) is the main route that connects tourists to Interstate 40, through Sevierville, Pigeon Forge, then Gatlinburg. Heavily traveled, with as many as 26,000 cars per day, U.S. 441 is plagued with high traffic congestions and delays on this route. The other major roadway through the city, Highway 321 intersects the parkway downtown, and connects Gatlinburg to Pittman Center and Cosby to the north. Hwy 321 intersects Interstate 40 near the Tennessee / North Carolina state line.

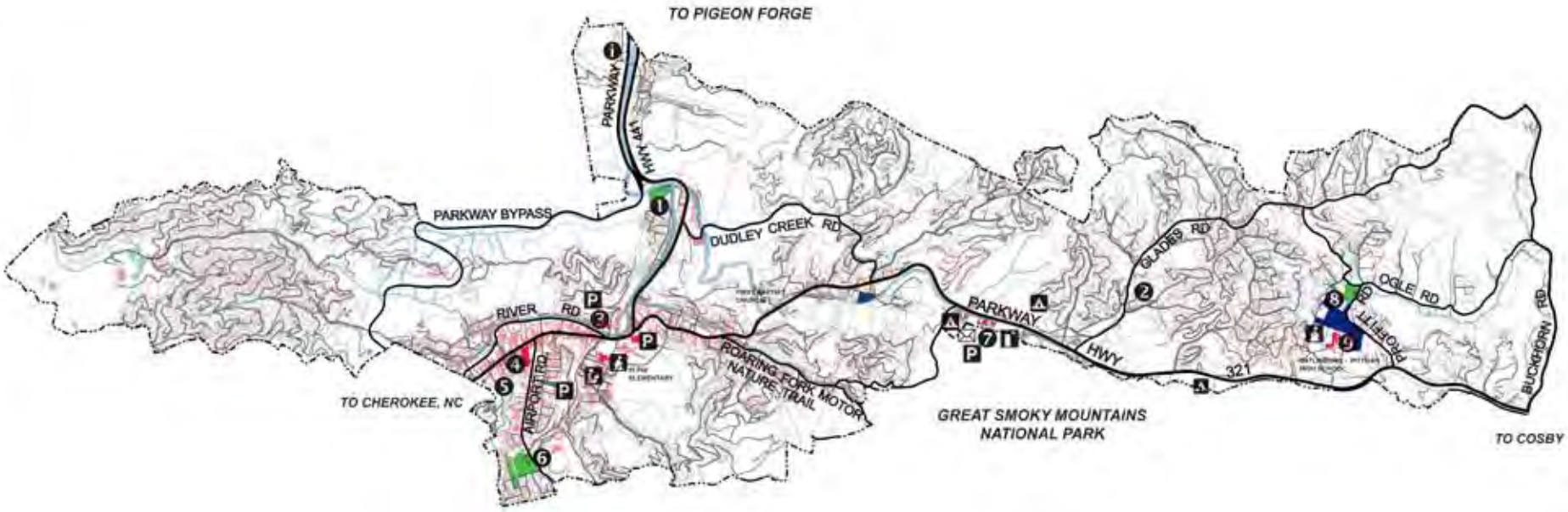
There are numerous other city streets in Gatlinburg that connect businesses and residential neighborhoods to these main arteries. With the heavy volume of traffic comes high levels of carbon monoxide and other greenhouse gasses that have been connected to climate change and have other negative environmental impacts. The development of a inter-connected regional greenways system could reduce congestion and its associated environmental impacts. Since the early 1990's, an effort has been made to create a regional system of greenways that connects Knoxville to the GSMNP. Particularly a route that links Knoxville to the existing greenway systems in Alcoa , Maryville, Pigeon Forge, Gatlinburg, and eventually the GSMNP. This group, The Great Smoky Mountain Greenways Organization is still very actively promoting this effort. The greenway network, if carried out on a regional scale, could help alleviate some of the vehicles' negative impacts or air and water quality. ***Figure 3.0*** shows the locations of major and minor roadways, existing trolley routes, as well as the associated parking and restroom facilities.

LEGEND

POINTS OF INTEREST

1. HERBERT HOLT PARK
2. ARTS AND CRAFTS COMMUNITY
3. RIPLEYS AQUARIUM OF THE SMOKIES
4. CONVENTION CENTER
5. CALHOUN VILLAGE
6. MYNATT PARK
7. CITY HALL
8. MILLS PARK
9. GATLINBURG COMMUNITY CENTER
- GATLINBURG WELCOME CENTER
- LIBRARY
- PUBLIC PARKING
- CAMPGROUND
- FIRE HALL
- SCHOOL
- POST OFFICE

- OPEN SPACE
- CITY OWNED
- POINTS OF INTEREST
- STRUCTURES




N

BWSC

*FIGURE 2.0*

*CULTURAL FEATURES*

# GATLINBURG GREENWAY MASTER PLAN

GATLINBURG, TENNESSEE

JUNE 2010

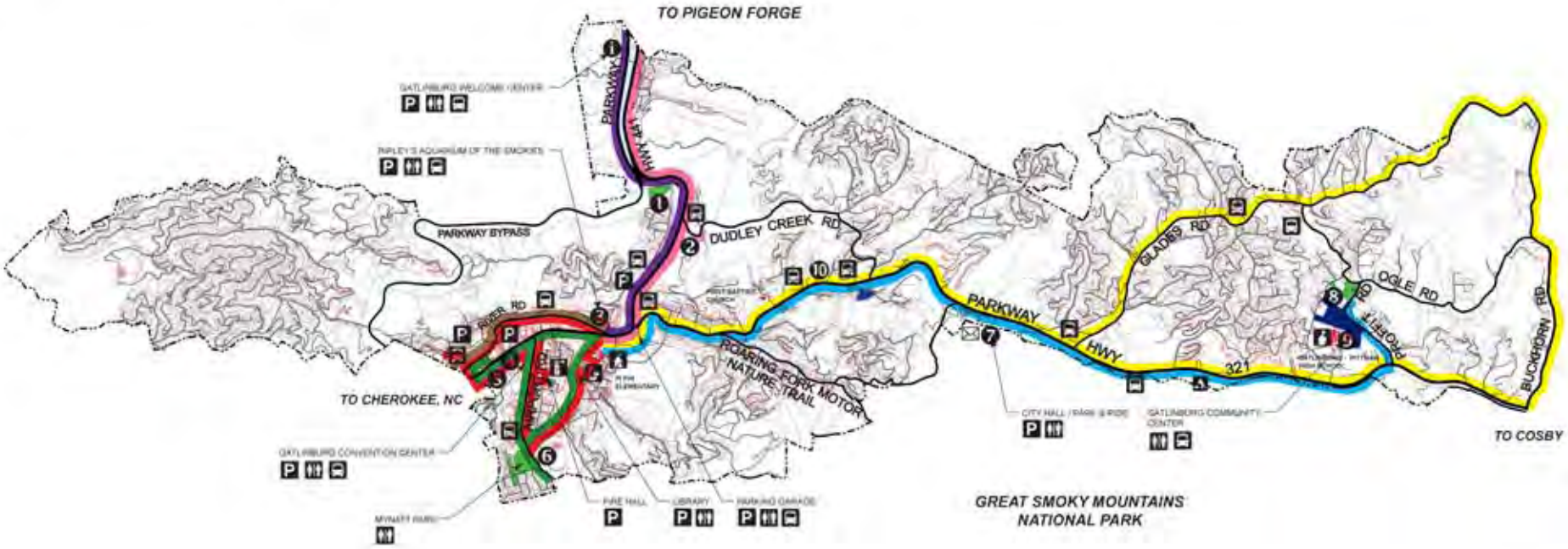
LEGEND

**POINTS OF INTEREST**

1. HERBERT HOLT PARK
2. UTILITY SUBSTATION
3. RIPLEY'S AQUARIUM OF THE SMOKIES
4. CONVENTION CENTER
5. CALHOUN VILLAGE
6. MYNATT PARK
7. CITY HALL
8. MILLS PARK
9. GATLINBURG COMMUNITY CENTER
10. GATLINBURG CHAMBER OF COMMERCE
- GATLINBURG WELCOME CENTER
- LIBRARY
- PUBLIC PARKING
- CAMPGROUND
- FIRE HALL
- SCHOOL
- POST OFFICE
- TROLLEY SHELTER
- OPEN SPACE
- CITY OWNED
- POINTS OF INTEREST
- STRUCTURES

**TROLLEY ROUTES**

- WELCOME CENTER
- DOLLYWOOD
- CITY HALL
- ARTS AND CRAFTS
- NATIONAL PARK
- DOWNTOWN PARKWAY
- DOWNTOWN RIVER RT




BWSC

N

*FIGURE 3.0*

*TRANSPORTATION*

# GATLINBURG GREENWAY MASTER PLAN

GATLINBURG, TENNESSEE

JUNE 2010

### 2.2.2 Land Use

The trail route can be an important linkage between current and future land uses. Consideration should be given to planned development and should avoid disruptive uses. Potential points of access to existing and planned developments should be scrutinized. If access is desirable but no easement or other method of access exists, attempt to gain the easement before planning is finalized. For paved trails, the easement width should ideally be 25 ft., and 16 ft. for primitive trails. These distances can be lessened (or increased) as topographic and vegetative conditions dictate. While a trail may legally be placed abutting a private property, potential property owner concerns should be considered.

The Downtown District along the parkway from Dudley Creek Bypass to Airport Road is the tourism core of Gatlinburg. Densely developed with no open space, the existing sidewalk network is well established and used. This includes Phase-1 of the Riverwalk, and the area from Highway 321 to the park boundary that offer an abundance of tourist attractions, such as Ripley's Aquarium of the Smokies, the Convention Center, as well as overnight hotels, condominiums, and time shares.

A narrow strip of dense commercially zoned parcels has developed on Highway 321 northward toward Parkway. The commercial development decreases moving farther away from the downtown core. Sidewalks are present on both sides of the road. The existing Highway 321 greenway, which is a wider sidewalk at the back of curb, was built by the Tennessee Department of Transportation (TDOT) during the Highway 321 widening project. This greenway stretches from Glades Road to the eastern city boundary. Beyond the commercial development is medium- to low-density residential neighborhoods and scattered overnight cabin rentals.


Signage along Glades Road

**Ski Mountain** is a relatively dense area of overnight cabin and condominiums. A major tourist destination, Ober Gatlinburg at the top of the mountain is accessible by vehicle or aerial tramway. The Ski Mountain area is accessed by an extremely steep and narrow roadway network, which makes designing and constructing greenways in this area very challenging, if not impossible.

The **Great Smoky Mountain Arts and Craft District** is a quaint blend of antique shops and craft shops. Located on Glades Road, the Arts and Craft District is surrounded by medium- to low-density residential. This area possesses a strong sense of community, due in part to the intimate scale of the valley landscape and the emanating mountain heritage.

The eastern-most section of Gatlinburg near Proffitt and Mills Park Road is the least developed area of the City. **East Gatlinburg** possesses the broadest valleys with the most open or vacant land in Gatlinburg. Nearly all low-density residential, this portion of town presents the greatest opportunity for future expansion of the City's population.

## 2.3 OPPORTUNITIES AND CONSTRAINTS

By performing an inventory of the existing natural and man-made features within the project area, it was possible to identify areas or features that could provide

opportunities or constraints to development of a greenway system and amenities. Identifying these opportunities and constraints guides the design of the greenway master plan by alerting the City to those elements that could influence the routing and design of the system in its preliminary stages. Identification of opportunities and constraints relied heavily on still and vehicular and walking reconnaissance of all major roads and side streets. Additionally, proposed and existing transportation plans provided by the City and aerial photography were utilized in this effort.

### 2.3.1 Opportunities

Natural resource opportunities for greenway development primarily involve vegetation and water bodies. Except for a few isolated areas, the main corridors of the Parkway and Highway 321 provide little opportunity for the routing of trails through forested areas. The residential areas north of Highway 321 and east of the Parkway provide the greatest opportunity for safe and forested trail development.

#### Public Land

When preparing an analysis for greenway master plans, the first step in the process is to identify any existing and available public land. Due to high property values, publicly owned land within the city is limited. Properties that are owned by governments, public utilities, etc., are often desirable, especially if their location is in close proximity to a greenway system. Schools, parks and existing greenways (such as the existing Mills Park Trail) provide highly desirable destinations for future greenways, and, along with other public areas such as utility rights-of-way and other government facilities, normally do not require acquisition negotiation or access easements. Examples of public lands that could serve as nodes or points of connectivity and providing opportunities for greenway development include:

- River Walk – Phase I
- Herbert Holt, Mynatt, and Mills Park
- Gatlinburg Welcome Center
- Gatlinburg –Pittman High school
- Pi Phi Elementary School
- City Hall, Post Office, and Library
- Fire Hall

#### Roadway Right of Way

With limited open and level land available for greenway development due to topography and urban growth, the existing and planned transportation corridors can be effectively utilized in trail design. Gatlinburg has a combination of major through roads and small, winding side streets. The streets nearly parallel to the Parkway and Highway 321 can provide pedestrian movement from one end of town to the other without adding to the congestion. Early planning and design is critical

in providing for adequate land area and easement considerations for trails along public roadways.

Although vehicular corridors are not the first choice for pedestrian or bicycle use, those with adequate right-of-way width can provide opportunities for pedestrian or bicycle circulation when other physical constraints prohibit this at other locations. Often the initial roadway construction allows for adequate clearance to include greenways without additional blasting of the rocky embankments. Though technically not a greenway, if adequate road shoulder width is present, a shared roadway or bike lane could be located inside the right-of-way of these roadways in a safe and aesthetic manner and provide an important link in the greenway system.

**Private Cooperation**

Additional opportunities exist where private land owners, whether commercial or residentially zoned, are willing to donate and/or sell easements for the purpose of creating the linear corridors for trail access or associated parking facilities. Merchants could benefit from the increased foot traffic generated by the greenway system. Initial planning of the greenway system should not preclude consideration of private property for greenway corridors, especially if they can provide important links in the system.

Because of the lack of public land, difficult topography, and the density of development, road right-of-way and adjacent private property offer one of the best opportunities for trail construction in Gatlinburg.

Photo of Trolley stop along Glades Rd.

**Gatlinburg Trolley System**

With a substantial park-and-ride lot located adjacent to Gatlinburg's City Hall, the trolley system possesses numerous routes with covered bench structures and maps guiding trolley users to the various destinations. Greenway segments should take advantage of these routes and trolley shelters as they provide tourists and citizens with means to avoid inclement weather and serve as the only existing alternative transportation method. The Parkway and Highway 321 are commonly congested during peak tourist seasons. Pedestrian traffic, especially crossing these two roadways, is sacrificed at the expense of the multi-lane divided highways. It is recommended that Gatlinburg continues to promote and accommodate trolley system use as much as possible. This will help alleviate some of the cross-town and quick-trip vehicular traffic. In addition, consideration should be given to adding bike racks to the trolleys to facilitate alternative transportation with bikes.

Leconte Creek near Calhoun Village

**Stream and River Corridors**

Stream and river channels typically offer the greatest potential opportunity for greenway construction. However, their use in a greenway system must be carefully planned and designed. Sensitive placement of trail surfaces and other facilities is essential to protect the river environment. The West Prong of the Little Pigeon River, Roaring Fork, Dudley Creek, LeConte Creek, East Prong Bird Creek, and Bird Creek form a linear network that could facilitate greenway development. However steep slopes along several stream channels and the high density of development

that is built right up to or over streams offers a set of challenges unique to Gatlinburg. Where the banks are sloped gently enough to allow for the greenway to be located directly along the river, views and the sounds of moving water greatly enhance the overall greenway experience. Present tree cover along some of the riverbanks should remain in order to provide shade and visual buffers from the adjacent roadways and development. Where possible, this plan should consider placement of trails along stream and river corridors.

**Great Smoky Mountain National Park**

Sugarlands Visitor Center

Without question, the greatest opportunity for the creation of an overall greenway master plan lies in Gatlinburg's close proximity to America's most visited National Parks, the Great Smoky Mountain National Park. The existing Gatlinburg Trail, when connected to the proposed greenway network, would safely connect hikers to the Sugarlands Visitor Center. With over 150 trails that extend approximately 800 miles, the Smokies are the destination of many outdoor enthusiasts. With backcountry shelters and more developed camping facilities alike, the proposed greenway master plan would offer an opportunity to connect residents and tourists to these natural wonders without relying on the automobile. Trail connections to the trail system in the Smokies should be a priority of this plan.

**Nodes and Connections**

It is important for the plan to provide connections from places where people stay (hotels, campgrounds, neighborhoods) to places where people want to go (restaurants, shops, parks, natural areas, schools, places of employment, etc.). In this way the trail system can function as an alternative form of transportation and as a recreational and fitness asset as well.

The inventory of Cultural Systems lists many of Gatlinburg's assets that could serve as nodes that should be connected by the system if it is technically feasible to do so.

### 2.3.2 Constraints

Constraints to the development of a greenway system are typically those elements that, either by physical obstruction and limitations or land use or legal restrictions, do not allow for or hinder the construction of a trail system or amenity. Identifying the constraints within the project area allows for efficient trail layout early in the design process. This helps to reduce construction time and budgets. Where wetlands or Threatened or Endangered species habitats are found, special considerations for design and construction are warranted. In many areas, existing land use limits trail construction.

**Steep topography and rock outcroppings**

Topography is a prime indicator of potential greenway design and certainly affects the development of Gatlinburg. Most of the areas of level topography have been cleared and developed for urban use. Gatlinburg has learned to design and construct buildings and roadways on steeper slopes, due to the high abundance of steep slopes within city limits. While steeper terrain provides protection for

forested areas and often highlights long-distance views to the mountains, they can sometimes constrain design and construction of trails to the point where rerouting is more prudent than expending funds on large volumes of earthwork and/or construction of expensive retaining walls. For the same reason, rock outcroppings should be avoided, however they can be a visual amenity to a greenway when located in close proximity. Accessibility guidelines allow for deviations from national standards, that are focused on providing equal access to recreation amenities, although where possible, greenway design and construction should conform to slope and trail width parameters. For a city-wide greenway system, more level terrain is preferred, especially when the trails provide for pedestrian and bicycle access.

**Floodplain and wetlands**

Although developing a greenway along a water body such as a river or creek is most often highly desirable, the design approach can be significantly constrained by accompanying floodplain issues. Constraints involve the time and financial burden for various permit applications from state and federal agencies that are imperative when proposing any type of development within such environmentally sensitive areas. Designers must take into account the hydraulics of the water body, and what impact the greenway may have on stream flow and upstream flooding. Also crossing water bodies with pedestrian bridges or culverts can be expensive and also contribute to flow or flooding problems, as well as negatively impacting wildlife migration along the waterway. Wetlands should be avoided altogether, if possible. However, they also are considered a valuable visual amenity, as well as an educational opportunity with proper trail location and informative signage.

**Roadway Intersections**

Restaurant spanning LeConte Cr.

These man-made constraints prohibit the development of a trail system due to their strict access requirements for pedestrians as well as vehicles. Further, crossing roads can be dangerous for trail users, and very cost prohibitive, often requiring overpasses or underpasses. The distance a pedestrian must travel to cross the Parkway with the high vehicular traffic volume constrains the development of trails from one side to the other, however the multitude of crosswalks help facilitate such crossings. A majority of bicycle crashes occur at intersections, so greenway segments should be designed to minimize the number and severity of roadway crossings. If mid-block crossings are absolutely necessary, both the vehicular and pedestrian needs should be considered and adequate signage provided to minimize the potential conflicts.

**Density of Development**

Along the West Prong of the Little Pigeon River and the tributaries, hotels and other businesses have been built up to (and sometimes over) the stabilized stream banks. In selected areas, private residences have also encroached on the banks. Where access is desired behind these establishments, easements would be required. In addition, the trail network will require additional bridges to avoid impacting private existing development. This makes the construction of greenways

along stream corridors expensive and difficult, if not impossible, to design and construct.

Development along much of the roadway network in town is relatively dense. This density provides challenges for trail routes along rights of way due to the number of drive and parking entrances, parking areas directly abutting the road surface, signs, outdoor merchandise display areas, and other obstructions that present trail design challenges. Many of these obstacles can be overcome through creative design approaches and cooperation by the affected business / property owners; however, resolution of these conflicts are beyond the scope of this plan and will have to be resolved during detailed planning for each trail segment.

# 3.0 Preliminary Master Plan / Public Input

This section describes the preliminary master plan and public input process. Upon completion of the area inventory and analysis phase, an overall greenway master plan was generated with 12 segments. The first public workshop was held on November 16, 2009, at the Gatlinburg City Hall. Benefits and myths of greenways were presented, as well as the preliminary greenway segments and associated nodes or points of interest.

## 3.1 PRELIMINARY GREENWAY SEGMENTS

***Figure 4.0*** shows the locations of the preliminary greenway segments that were presented to the public at the first public meeting..

- **Buckhorn Road**

Connecting the existing greenway along Hwy. 321 to Glades Road and the proposed Glades Road greenway, this 1.78-mile segment is located along the eastern boundary of the Gatlinburg city limits. Low density residential uses exist along the entire length. Buckhorn Road also has lower traffic volumes and is already used as a walking destination by Gatlinburg residents.

- **Mills Park Road**

This segment extends from the existing greenway along Highway 321 to Mills Park along Mills Park Road. This .57-mile segment is imperative for safe pedestrian access to and from the existing greenway trail to Gatlinburg – Pitman High School, the library, and Civic Center.

- **Ogle Road**

Extending from Buckhorn Road to Mills Park and the proposed Mills Park greenway, this 1.2-mile trail forms part of a loop for recreationally focused greenway users while also connecting residential neighborhoods in East Gatlinburg to the High School, Library, and Civic Center. Already utilized for cross-country events and local walkers, this scenic stretch of roadway is gently rolling and follows the East Prong Bird Creek. Easements would be desirable to allow for additional separation of the shared use greenway and Ogle Road.

- **Proffitt Road**

Connecting Glades Road to Mills Park and the proposed Mills Park greenway, the .62-mile trail segment would be a critical portion of the greenway loop mentioned above.

- **Glades Road**

Stretching from Buckhorn Road and the proposed Buckhorn Road Greenway, 3.2 miles to Hwy. 321, this trail segment passes through the Great Smoky Mountain Arts and Craft Community. Forming the northern portion of the greenway loop, the narrow roadway winds through low density residential, terminating near the park and ride trolley lot at Gatlinburg City Hall.

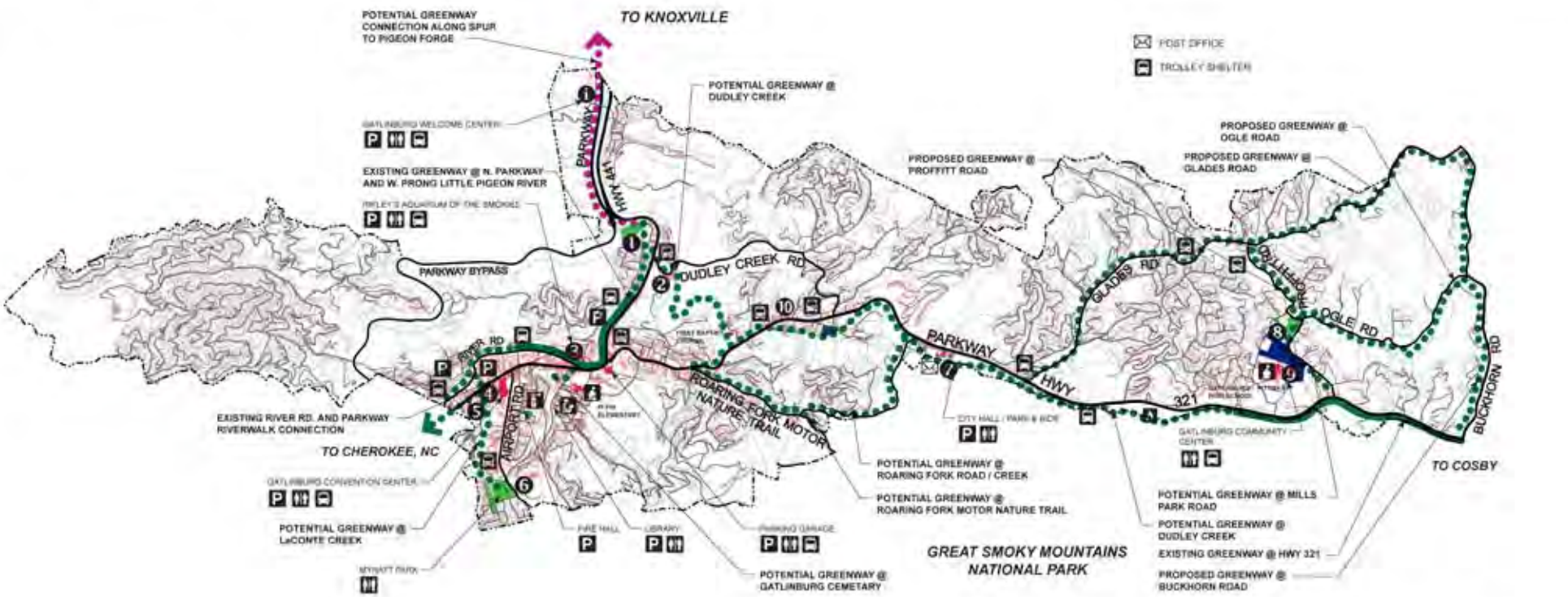
LEGEND

POINTS OF INTEREST

1. HERBERT HOLT PARK
2. UTILITY SUBSTATION
3. RIPLEYS AQUARIUM OF THE SMOKIES
4. CONVENTION CENTER
5. CALHOUN VILLAGE
6. MYNATT PARK
7. CITY HALL
8. MILLS PARK
9. GATLINBURG COMMUNITY CENTER
10. GATLINBURG CHAMBER OF COMMERCE
- GATLINBURG WELCOME CENTER
- LIBRARY
- PUBLIC PARKING
- CAMPGROUND
- FIRE HALL
- SCHOOL
- OPEN SPACE
- CITY OWNED
- POINTS OF INTEREST
- STRUCTURES

GREENWAY LEGEND

- EXISTING GREENWAY
- PROPOSED GREENWAY CORRIDOR
- PROPOSED PIGEON FORGE GREENWAY CONNECTION




N

BWSC

*FIGURE 4.0*

*GREENWAY MASTER PLAN*

# GATLINBURG GREENWAY MASTER PLAN

GATLINBURG, TENNESSEE

OCTOBER 2009

- **Dudley Creek**

Also totaling 3.2 miles, the proposed Dudley Creek greenway would begin near the Sevier County Electric substation (on Dudley Creek Road near the intersection of the parkway/ Hwy 441) following Dudley Creek through undeveloped forest to the First Baptist Church on Hwy. 321. The trail continues to follow Hwy. 321 and Dudley Creek, abutting the Great Smoky Mountain National Park where possible.

- **Roaring Fork Road / Creek**

Connecting the Proposed Dudley Creek greenway and Hwy. 321 with the Roaring Fork Motor Nature Trail, this 1.76-mile trail segment follows a roadway so narrow, enlarged pull-offs would be required to allow vehicles to pass. With minimal vehicular use, the roadway abuts the Great Smoky Mountain National Park, and already posses the scenic character of a greenway.

- **Roaring Fork Motor Nature Trail**

This short .30-mile segment would connect the potential greenway at Roaring Fork Road to the historically significant Roaring Fork Motor Nature Trail.

- **Gatlinburg Cemetery**

The shortest segment considered as part of the proposed greenway network, the .09-mile trail would provide additional access to cemetery visitors.

- **LeConte Creek**

The LeConte Creek greenway trail would follow the LeConte Creek corridor rather than Airport Road, which runs parallel to the stream. The proposed LeConte Creek greenway will be one of the more difficult segments to implement due to the steep terrain and narrow corridor of available land. However, with this challenge comes great character and an opportunity to make this proposed trail segment the most unique as well. Suspension bridges and cantilevered walkways would have to be employed to allow pedestrians to traverse the .85 miles of rambling creek, which connects Calhoun Village to Mynatt Park.

- **River Road / River Walk Extension**

An extension of the existing River Walk greenway, this proposed .60-mile segment will continue to follow the West Prong of the Little Pigeon River until reaching the west boundary of Gatlinburg's city limits. Already a great success, the existing portion of the River Walk has provided merchants with an aesthetic setting, conducive to outdoor dining and shopping.

- **Hwy 441 / Parkway / Spur**

Following the West Prong of the Little Pigeon River to the north, this proposed 1.52-mile trail segment will be a challenge to design and implement due the National Park Service ownership and the sensitivity of the steep terrain. If approved, this segment will connect the existing River Walk greenway to Herbert Holt Park and the Gatlinburg Welcome Center on the north edge of Gatlinburg's city limits.

## 3.2 PUBLIC INPUT (PUBLIC MEETING AND INTERNET SURVEY)

The preparation of the Master Plan utilized an open planning process to gain public input and consensus on the results. The initial public meeting was held at the Gatlinburg City Hall, with approximately 35 people in attendance. At the meeting, those in attendance were given a survey to determine the level of public support for each preliminary greenway segment. Appendix A contains a copy of the initial presentation, attendance sheet, and a summary of the survey results. The survey allowed attendees to respond to each segment individually, and provide additional suggestions if desired. The following feedback was provided during the meeting:

- The feedback was overwhelmingly positive. 100% of those in attendance support of the creation of a greenway system in Gatlinburg, 92% "Strongly Supporting" the greenway system.
- Four segments received less support than the others proposed. 23% of the surveyed public did not support the Gatlinburg cemetery segment. 8% didn't support the Buckhorn Road, Proffitt Road, and Glades Road segments. However, those same three segments received over 50% "strongly support" from the remainder of the Gatlinburg residents.
- The majority of the public was supportive of the initial segments that would create a loop in the east portion of Gatlinburg. Glades, Buckhorn, and Proffitt Road would be the main segments of this loop trail.
- Also suggested by several attendees was the idea of connecting the Gatlinburg greenway system to the Foothills Parkway in the northeast portion of town. Several also desired pedestrian connections to Pittman Center and Greenbriar to the east.
- In general, the segments that connected more dense areas of Gatlinburg received more positive feedback, as they would have greater economic impacts on local business.

Additional comments include:

> ***"This work will be a great asset for our area".***
>
> ***"I am so excited about this opportunity for residents and visitors alike. Prior to this, I would drive on a weekly basis to Townsend to ride my bike on a safe trail. Thank you Gatlinburg for doing something for the welfare of your citizens".***
>
> ***"Hopefully they (the greenway segments) can connect with bike lanes where needed".***
>
> ***"When possible, avoid roads".***

Based on survey comments received and a more in-depth review of the initial segments in the field, the master plan was refined, and preliminary cost

and phasing information was prepared. This information was presented to approximately 45 attendees at a second public meeting on January 26, 2010, also at the Gatlinburg City Hall. In this meeting, the survey results from the first meeting and the refined greenway segments / master plan were presented.

The following segments were removed from the plan that was presented at the first meeting.

**The Gatlinburg Cemetery segment** was removed due to the short length and lack of public support. It was decided that the distance did not meet "greenway status" and that the existing access was suitable for the community's needs.

**The Spur, Highway 441 segment** was removed because it is not property currently owned and controlled by the City of Gatlinburg. While still a crucial segment for regional connectivity, this segment is not feasible at this time due to the fact that it is owned by the Park Service and the probability of success in getting this segment in place is very low.

Initially the **Riverwalk extension** was included in this master plan, but was removed in the revised plan because it would not serve as a multi-use trail. The **Roaring Fork Road / Creek segment** was also removed because portions of the road are within the GSMNP boundary, and the city-owned portions of the road have cut and fill slopes that are too steep for greenway construction.

## 3.3 SUMMARY

In general, the majority of participants in the public meeting were very supportive of the idea of a Gatlinburg greenway system that would provide links from the residential areas of the city to the denser tourist-based businesses in the downtown core. Segments that were removed were not owned by the City or deemed not feasible due to physical constraints or lack of public support. After the second public meeting, there were minor changes to individual trail segments, but no major changes to the overall greenway network were made. Following the meeting, an additional field review of some of the greenway segments was conducted to determine the major design elements that would be needed to construct the proposed trails.

# 4.0 Final Greenway Master Plan / Greenway Segments

Based on the inventory and analysis, public input process, and field review of the proposed greenway segment, the final greenway master plan was prepared with associated cost and phasing recommendations. The following presents a description of the proposed final greenway segments as shown on ***Figure 5.0.***

## 4.1 FINAL GREENWAY SEGMENTS

**1. Proffitt Road – Hwy 321 to Community Center / Mills Park**

Utilizing the existing facilities at Mills Park, Library, Community Center, and Gatlinburg Pittman High School as a trail head, this 1,570 linear foot (LF) asphalt trail (.3 mile) will connect the existing Highway 321 greenway to this heavily used pedestrian hub. The trail will parallel Proffitt Road on the left side (west) for 350 LF crossing the road once, and continuing for 850 LF along the right (east) side of Proffitt before crossing a final time and tying into the exiting 3' wide asphalt trails near the Community Center entrance. Road crossings will require signage and striping, but in general the terrain and Right-of-Way (ROW) is conducive for greenway construction. This will be one of several greenway segments that, when combined, creates a loop that is already used informally as a walking trail and cross-country course.


Gatlinburg Community Center

**2. Mills Park Road – Hwy 321 to Mills Park / Community Center**

Also using the existing facilities at Mills Park, Library, Community Center, and Gatlinburg-Pittman High School, this 2,060-LF asphalt trail (.4 mile) will make another connection to the existing Highway 321 greenway and Mills Park trail. With only one crossing needed for this segment, the trail will parallel Mills Park Road on the left (west), and is a highly valuable addition to the overall system with little initial investment for the city.

**3. Proffitt Road – Mills Park to Glades Road**

Crucial to establishing a loop trail with the trail segments listed above, the 3,300-LF (.625 mile) asphalt trail is located on the western side of Proffitt Road. The trail segment aims to connect the residents along Glades Road to Mills Park, Community Center, Library, and Gatlinburg-Pittman high school, and eventually the existing Highway 321 greenway. An existing trolley stop at the intersection of Proffitt and Glades Road will allow for some parking and directional signage. One stream crossing will be needed near the connection to Mills Park.

**4. Ogle Road – Buckhorn Road to Proffitt Road**

Connecting Buckhorn and the Library, Community Center, Mills Park, and Gatlinburg-Pittman high school, this 6,800-LF (1.3 mile) trail segment will require five small pedestrian bridges and several road crossings. The trail will follow the East Prong Bird Creek, making this segment more expensive and aesthetic than some of the other proposed greenway segments. Nearly 1,800 LF of the trail will be concrete due to the close proximity to the floodplain, the remainder would be asphalt. ***Figure 6*** presents a rendering depicting the appearance of this segment.


FIGURE 5.0

GATLINBURG GREENWAY MASTER PLAN
GATLINBURG, TN

FIGURE 6.0
GATLINBURG GREENWAY MASTER PLAN

OGLE ROAD GREENWAY

**5. Buckhorn Road – Ogle Road to Glades Road**

With two pedestrian bridges needed to span small streams, the 4,200-LF (.8 mile) asphalt trail segment connects Ogle and Glades Road. Steep terrain on the west side of the roadway makes trail design and construction a challenge. The east side of the roadway is outside the Gatlinburg City limits, making the trail on the east side not feasible. Terraces and some significant grading will be required to complete this greenway trail. The proposed greenway trail would need to be constructed at grade to avoid parking conflicts as depicted in ***Figure 7.***

**6. Glades Road – Buckhorn Road to Proffitt Road**

Connecting Buckhorn Road to Proffitt Road, this 7,950-LF (1.5 mile) trail has two potential routes for the western 2,800 LF. One option would follow East Prong Bird Creek and would need to be constructed of concrete with several stream crossings, while the less expensive option would be constructed of asphalt and has fewer stream crossings. The second option would be located on the north side of Glades Road, within the R.O.W. where possible. With an existing trolley stop at the intersection of Proffitt and Glades Road, an additional trail head would not be needed. Numerous challenges will require additional design consideration, such as existing parking lots and shopfronts that create a narrow right-of-way corridor to route the greenway trail. The braided network of streams along the roadway will require boardwalks and other creative trail construction methodology to ensure that the trail is out of the floodway. This segment becomes the final connection needed to create a roughly 3-mile loop trail in east Gatlinburg.

**7. LeConte Creek – Mynatt Park to River Road**

Possibly the most expensive and interesting trail segment within the overall greenway network, the LeConte Creek trail will be constructed of concrete when located within the floodplain. As shown in ***Figures 8 and 9***, portions of the trail may need to utilize suspension bridges to span LeConte Creek, minimizing the impacts of the trail on the fish and wildlife habitat. Located in an area of dense tourist development, this 4,200-LF (.8 mile) trail segment will provide a safe pedestrian connection from the thousands of hotel rooms along Airport Road, to shops and restaurants downtown to the south, and Mynatt Park and eventually the GSMNP to the north.

Entrance sign to Mynatt Park

**8. Glades Road – Proffitt Road to Hwy 321**

Continuing on the north side of roadway, the 8,845-LF (1.67 mile) trail would connect the 3-mile loop system with Highway 321 near City Hall. Bypassing the Great Smoky Mountain Arts and Crafts District, this asphalt greenway will require several pedestrian bridges as it closely follows several tributaries to Dudley Creek. Winding through low density residential areas, this greenway will terminate near the Park and Ride trolley lot and have access to existing restrooms and parking.

**9. Dudley Creek – City Hall**

Only 2,060 LF, the short but scenic greenway segment will allow trail users to get away from Highway 321, and instead follow Dudley Creek adjacent to the GSMNP as it passes between a thin sliver of private and publicly owned parcels. Concrete surfacing will be needed as periodic flooding of the adjacent Dudley Creek would be too damaging to an asphalt or flexible paving system. One of the shortest and

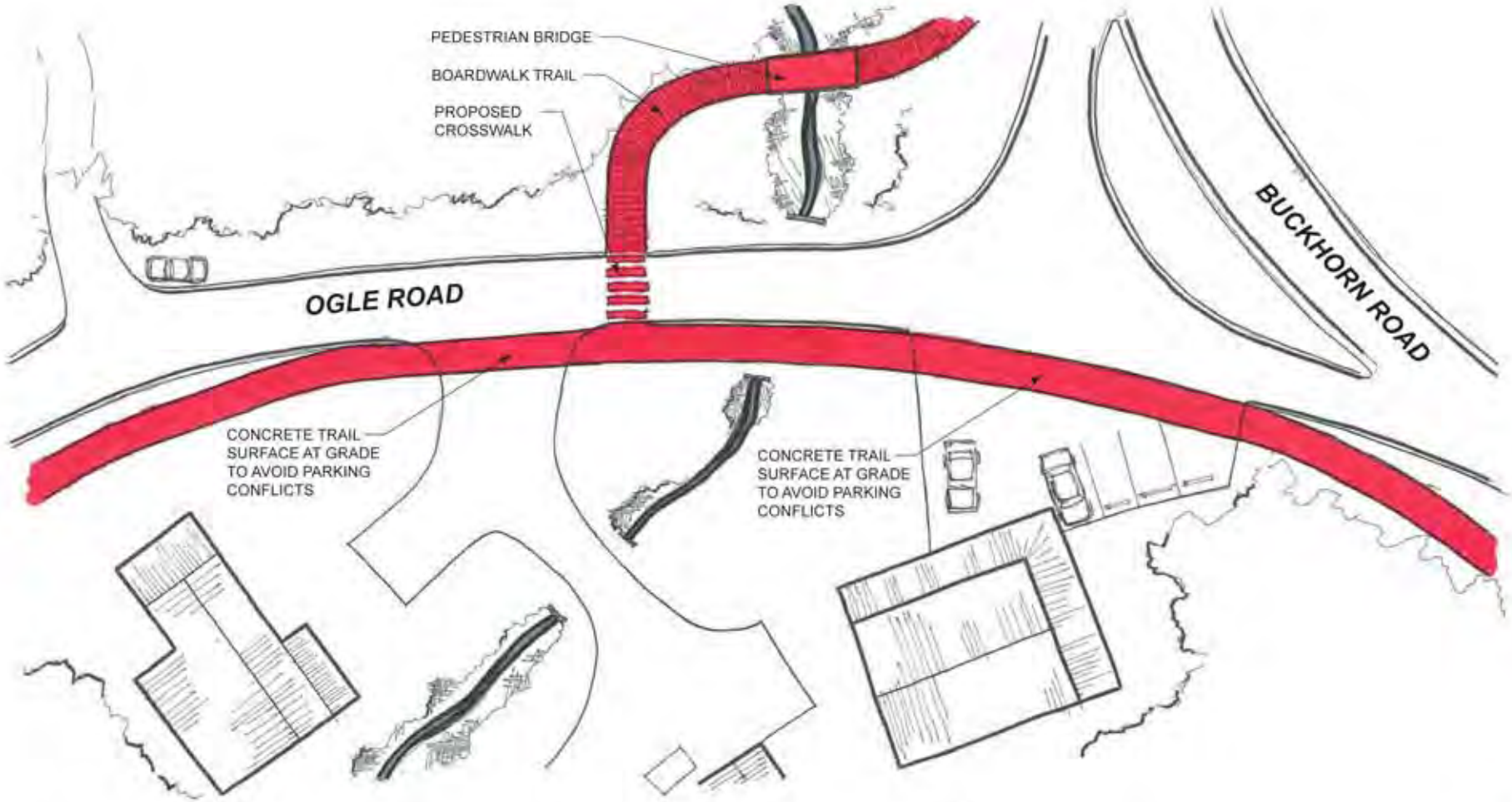



**FIGURE 7.0**

**GATLINBURG GREENWAY MASTER PLAN**

BUCKHORN ROAD GREENWAY AT OGLE ROAD GREENWAY

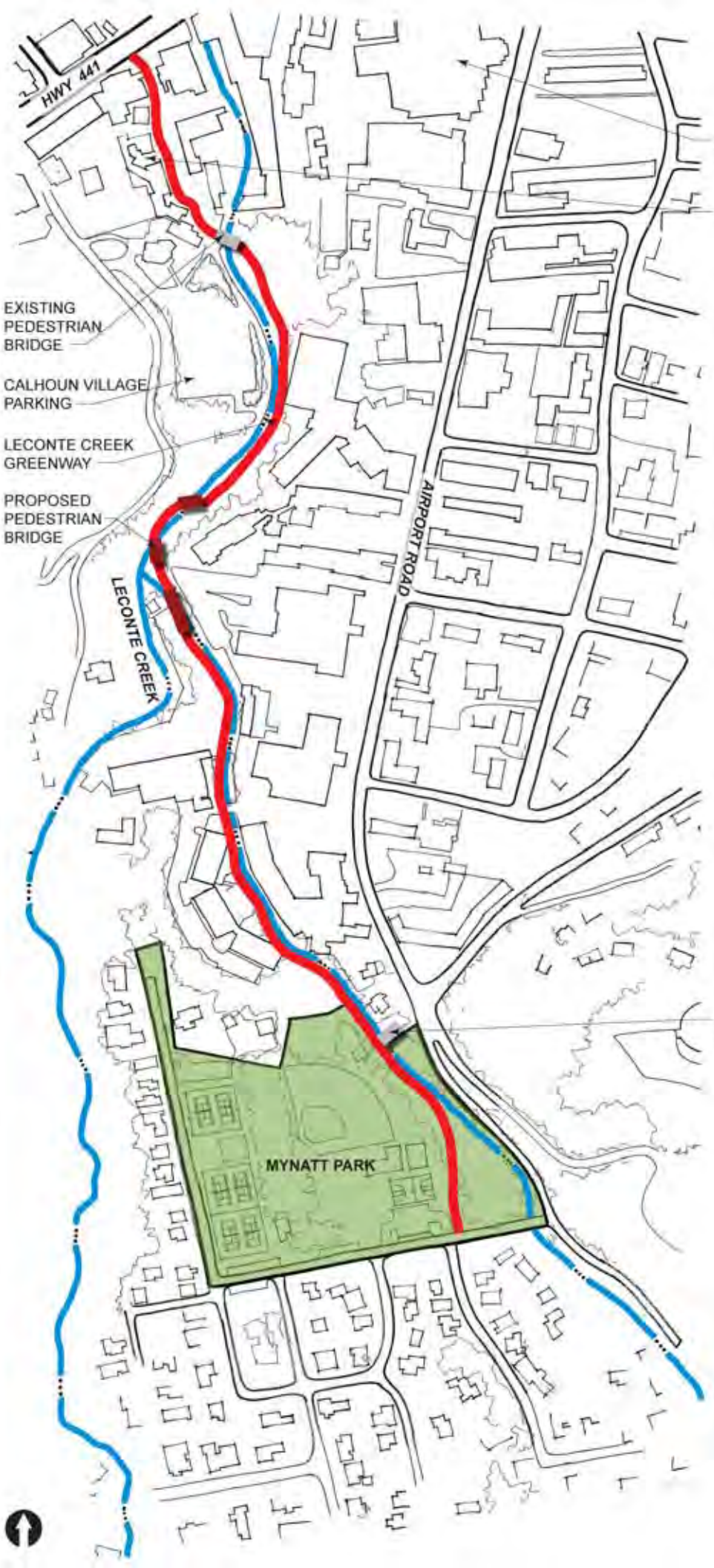

HWY 441
GATLINBURG CONVENTION CENTER
CALHOUN VILLAGE
EXISTING PEDESTRIAN BRIDGE
CALHOUN VILLAGE PARKING
LECONTE CREEK GREENWAY
PROPOSED PEDESTRIAN BRIDGE
AIRPORT ROAD
LECONTE CREEK
EXISTING PEDESTRIAN BRIDGE
MYNATT PARK

FIGURE 9.0
GATLINBURG GREENWAY MASTER PLAN

least expensive trail segments, the area adjacent to Dudley Creek behind City Hall already has several picnic tables and benches, making a great lunch destination or resting spot for more active trail users. See ***Figures 10 and 11 f***or a character rendering and plan view of this proposed greenway segment.

**10. Dudley Creek – Hwy 321 to Bypass**

The Dudley Creek Trail will surely be one of the most scenic trail segments, due to the heavily forested slopes and close interaction with Dudley Creek. Serving as a trail head location for the western portion of the trail network, the First Baptist Church has ample parking as well as other greenway amenities. Providing a pedestrian bypass of the more densely developed downtown, this 5,700-LF (1.07 mile) concrete trail will require several pedestrian bridges, with spans slightly larger than the other pedestrian crossings. A residence is located behind the church, adjacent to the picnic pavilion, which will dictate that the left (west) side of Dudley Creek be used initially, while the slopes of the mountainside will control the final location of the remainder of the trail segment. Slightly over one mile, this trail will become a showcase of the natural scenery that attracts visitors and residents to Gatlinburg alike. Some additional signage could be provided to inform trail users of the native plant and wildlife communities unique to the Appalachian region. As shown in ***Figure 12***, the greenway segment will terminate at the existing sidewalk near a substation on Dudley Creek Bypass and the businesses and trails along Highway 441.

Accessible fishing pier in Herbert Holt Park

**11. North Gatlinburg – Herbert Holt Park @ Dudley Creek Bypass**

Also constructed of concrete, the North Gatlinburg trail serves as a entry feature for the city. Connecting Herbert Holt Park at the city limits, the 1,611-LF (.3 mile) concrete trail will meander along the West Prong Little Pigeon River at the rear of several new developments. More urban in nature, the existing park facilities will serve as a great trail head for this section of town, with restrooms, picnic pavilion, benches, and ample parking.

**12. Buckhorn Road – Ogle Road to Hwy 321**

Continuing south from the intersection of Ogle and Buckhorn Road, this challenging 5,475-LF (1.03 mile) trail will be along the west side of Buckhorn Road. Steep terrain and rock outcrops will require extensive grading studies and creative routing solutions for nearly the entire segment. When complete, this greenway will tie into the existing Highway 321 greenway and the Ogle Road greenway, creating another loop trail for more active recreation. Potential agreements with Pittman-Center may allow for alternative design solutions that would enhance the trail experience, while moving the segment to the east side of the roadway and an area of less topographic constraints.

**13. Roaring Fork Road – Roaring Fork Motor Nature Trail to Parkway**

Connecting the historic Roaring Fork Motor Nature Trail to the proposed Gatlinburg greenway system, the 3,580-LF (.67 mile) concrete greenway segment will be among the most scenic and challenging segments to design and construct. Several existing businesses and hotels were built directly along the banks of Roaring Fork Creek, causing parking and trail routing conflicts. Portions of the trail may need to be cantilevered in nature, as to minimize the environmental

FIGURE 10.0
GATLINBURG GREENWAY MASTER PLAN

DUDLEY CREEK GREENWAY AT CITY HALL

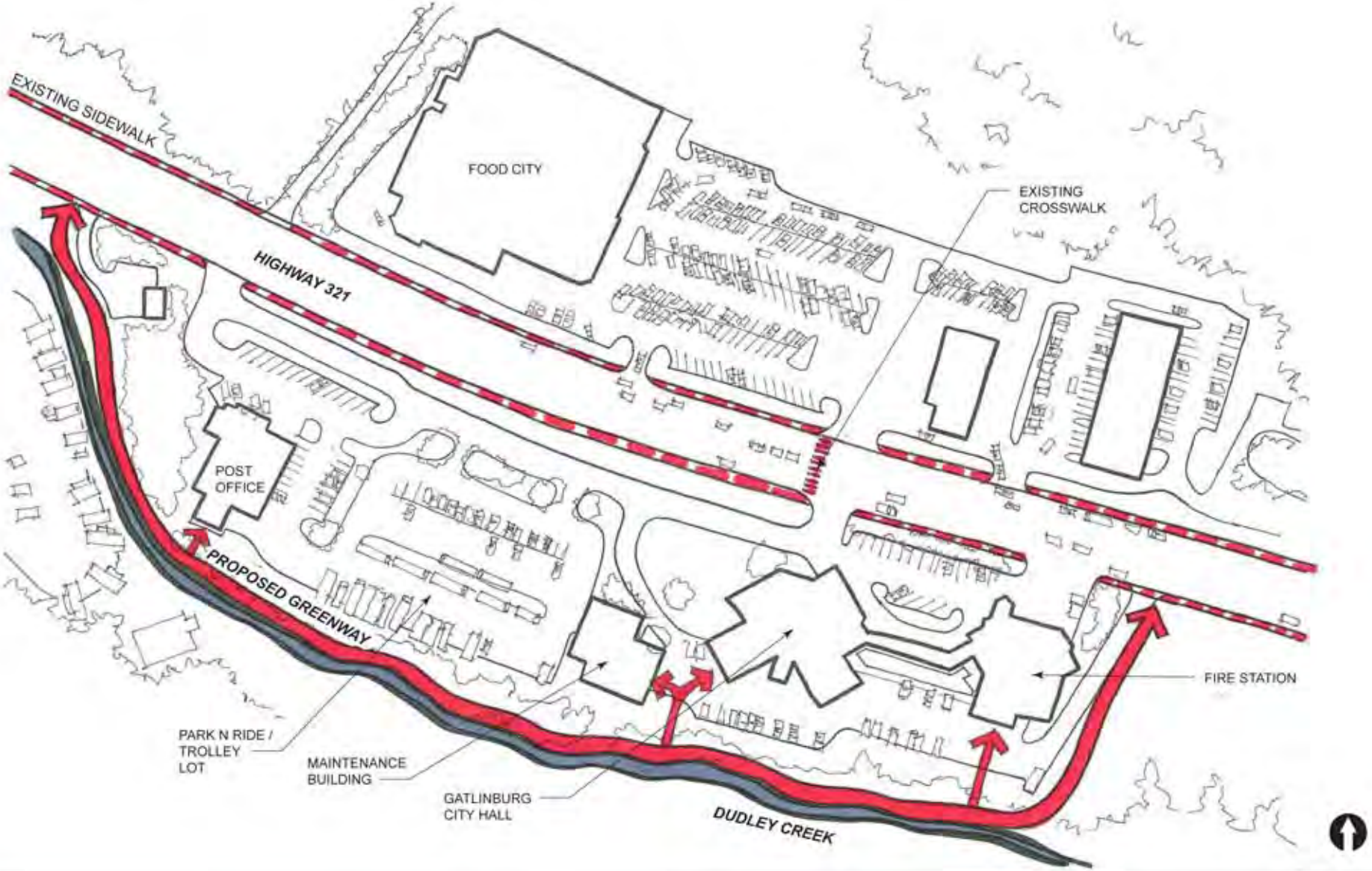



**FIGURE 11.0**

**GATLINBURG GREENWAY MASTER PLAN**

DUDLEY CREEK GREENWAY AT CITY HALL

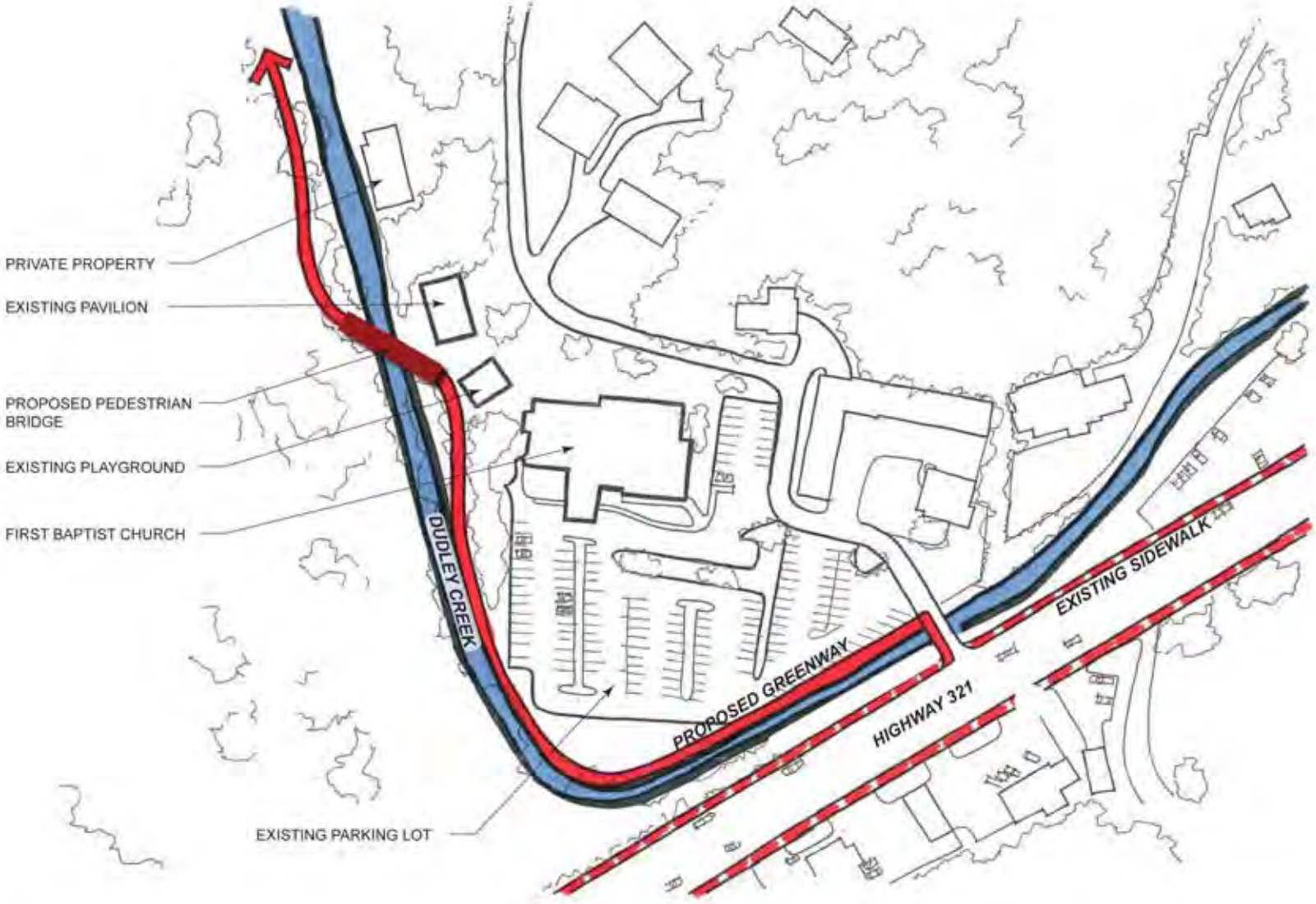



**FIGURE 12.0**

**GATLINBURG GREENWAY MASTER PLAN**

DUDLEY CREEK GREENWAY AT FIRST BAPTIST CHURCH

impacts while allowing user interaction. Low density residential and scattered cabin rentals are common in this area, and the proposed trail segment would be a safe option for the travel to and from the Highway 321 and eventually the downtown district at the terminus of the greenway segment. Several pedestrian bridges will also be needed to provide this access, although the lengths and widths may vary as detailed design of the greenway has not been completed.

## 4.2 ADDITIONAL RECOMMENDATIONS

As several attendees of the public workshop recommended, bike lanes should be included and studied wherever possible. The review of all Gatlinburg roadways for feasibility of bike lanes is beyond this scope of this project. However, it is recommended that all roadways that are conducive to bike lane construction be signed, marked, and designated as such. It is recommended that a study be conducted to better comprehend the feasibility of bike lanes, and other bike-related infrastructure. All new roadways should consider bike lane additions, and ensure that the bike lanes follow the American Association of State Highway and Transportation Officials (AASHTO) standards for bike lane width and location. In addition to the bike lanes, additional bicycle amenities will need to be considered, such as bike racks near the entrances to storefronts, parks, and other nodes or points of interest identified in this study. Signage should also be used in combination with pavement markings and rider educational programs to ensure that drivers and cyclists are aware of the rules and potential dangers of shared use roadways.

With an integrated greenway system, bicycle use will increase as the multi-use trails are constructed. To adapt to this change in pedestrian movement, the trolleys should accommodate carrying bicycles as trail users utilize the trolley system to access different areas of the business community. This feature could become very effective as the regional greenway initiative seeks to connect various East Tennessee communities.

As new trail segments are constructed, it is crucial that the existing trails and sidewalks are widened where the connection points occur. The asphalt trails near the community center and Gatlinburg-Pittman High School, for example, are too narrow for bicycle use and are located in a dense area of proposed greenways.

The City should also review each new development plan and consider the dedication of easements for greenway trail construction, especially whenever it could contribute to the overall greenway network system.

## 4.3 PHASING AND BUDGETING OF CONSTRUCTION

Phasing the implementation of the Gatlinburg Greenway Master Plan allows the City to plan and budget for continuing growth. It allows the City to prioritize its recreation and transportation needs and coordinate improvements with other projects. The phases listed below, and shown on ***Figure 13***, represent the design team's thoughts for a logical progression of Master Plan implementation. The phasing order can certainly be changed to reflect the changing needs of the City or other unforeseen future issues.

LEGEND

**POINTS OF INTEREST**

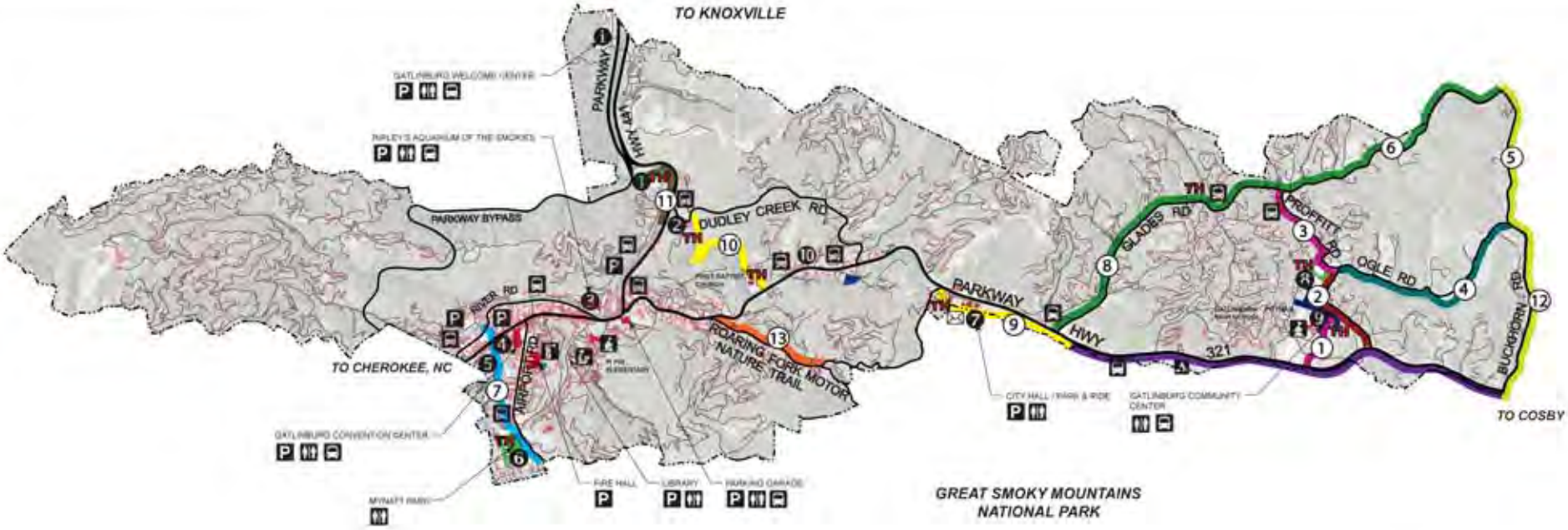
1. HERBERT HOLT PARK
2. UTILITY SUBSTATION
3. RIPLEY'S AQUARIUM OF THE SMOKIES
4. CONVENTION CENTER
5. CALHOUN VILLAGE
6. MYNATT PARK
7. CITY HALL
8. MILLS PARK
9. GATLINBURG COMMUNITY CENTER
10. GATLINBURG CHAMBER OF COMMERCE
11. GATLINBURG WELCOME CENTER
12. LIBRARY
13. PUBLIC PARKING
14. CAMPGROUND

FIRE HALL
SCHOOL
POST OFFICE
TROLLEY SHELTER

OPEN SPACE
CITY OWNED
POINTS OF INTEREST
TH TRAIL HEAD
(1) PHASE NUMBER

**GREENWAY TRAIL SEGMENTS**

- LECONTE CREEK
- DUDLEY CREEK
- ROARING FORK ROAD
- GLADES ROAD
- MILLS PARK ROAD
- PROFFITT ROAD
- OGLE ROAD
- BUCKHORN ROAD
- NORTH GATLINBURG TRAIL
- EXISTING HWY 321




BWSC

FIGURE 13.0

# GATLINBURG GREENWAY MASTER PLAN

GATLINBURG, TENNESSEE

JUNE 2010

Included with the phasing descriptions are preliminary budgets. These budgets are very preliminary due to the conceptual level of detail provided in the plan. As the phases are incorporated into the City's planning process, construction documents will be developed for each phase allowing for greater design detail and more accurate opinions of probable costs. However, the budgets provided here give the City general budget costs for long-term planning purposes. The costs are based on the average of recent greenway construction costs from local projects. The rough order of magnitude cost estimate includes a separate line item for pedestrian bridges. The costs assume a trail width of 8', and do not include costs for items such as retaining walls, trail lighting, site furnishings, signage, or landscaping improvements.

## 4.4 ROUGH ORDER OF MAGNITUDE COST ESTIMATE

Provided on following two pages.

| SEGMENT PRIORITY | DESCRIPTION | QNTY | UNIT | COST | TOTAL |
|---|---|---|---|---|---|
| 1 | **Proffitt Road-Hwy 321 to Mills Park** | | | | |
| | 8' Wide Asphalt Trail | 1570 | LF | $120.00 | $188,400.00 |
| | Pedestrian Bridge | 0 | Ea | $60,000.00 | $0.00 |
| | **TOTAL** | | | | **$188,400.00** |
| 2 | **Mills Park Road-Hwy 321 to Comm. Ctr.** | | | | |
| | 8' Wide Asphalt Trail | 2,060 | LF | $180.00 | $370,800.00 |
| | Pedestrian Bridge | 0 | Ea | $60,000.00 | $0.00 |
| | **TOTAL** | | | | **$370,800.00** |
| 3 | **Proffitt Road-Mills Park to Glades Rd.** | | | | |
| | 8' Wide Asphalt Trail | 3,300 | LF | $180.00 | $594,000.00 |
| | Pedestrian Bridge | 1 | Ea | $60,000.00 | $60,000.00 |
| | **TOTAL** | | | | **$654,000.00** |
| 4 | **Ogle Road** | | | | |
| | 8' Wide Concrete Trail | 1,790 | LF | $170.00 | $304,300.00 |
| | 8' Wide Asphalt Trail | 5,000 | LF | $150.00 | $750,000.00 |
| | Pedestrian Bridge | 5 | Ea | $60,000.00 | $300,000.00 |
| | **TOTAL** | | | | **$1,354,300.00** |
| 5 | **Buckhorn Road-Ogle Road to Glades Rd.** | | | | |
| | 8' Wide Asphalt Trail | 4,500 | LF | $180.00 | $810,000.00 |
| | Pedestrian Bridge | 2 | Ea | $60,000.00 | $120,000.00 |
| | **TOTAL** | | | | **$930,000.00** |
| 6 | **Glades Road - Buckhorn Road to Proffit Rd.** | | | | |
| | 8' Wide Asphalt Trail | 7,950 | LF | $180.00 | $1,431,000.00 |
| | Pedestrian Bridge | 6 | Ea | $60,000.00 | $360,000.00 |
| | **TOTAL** | | | | **$1,791,000.00** |
| 7 | **LeConte Creek** | | | | |
| | 8' Wide Concrete Trail | 4,200 | LF | $450.00 | $1,890,000.00 |
| | Pedestrian Bridge | 5 | Ea | $60,000.00 | $300,000.00 |
| | **TOTAL** | | | | **$2,190,000.00** |

| | | | | | |
|---|---|---|---|---|---|
| **8** | **Glades Road-Proffit Rd. to Hwy 321** | | | | |
| | 8' Wide Asphalt Trail | 8,845 | LF | $180.00 | $1,592,100.00 |
| | Pedestrian Bridge | 5 | Ea | $60,000.00 | $300,000.00 |
| | **TOTAL** | | | | **$1,892,100.00** |
| **9** | **Dudley Creek - City Hall** | | | | |
| | 8' Wide Concrete Trail | 2,060 | LF | $170.00 | $350,200.00 |
| | Pedestrian Bridge | 0 | Ea | $60,000.00 | $0.00 |
| | **TOTAL** | | | | **$350,200.00** |
| **10** | **Dudley Creek - Hwy 321 to Bypass** | | | | |
| | 8' Wide Concrete Trail | 5,700 | LF | $200.00 | $1,140,000.00 |
| | Pedestrian Bridge | 3 | Ea | $60,000.00 | $180,000.00 |
| | **TOTAL** | | | | **$1,320,000.00** |
| **11** | **North Gatlinburg** | | | | |
| | 8' Wide Concrete Trail | 1,611 | LF | $145.00 | $233,595.00 |
| | Pedestrian Bridge | 0 | Ea | $60,000.00 | $0.00 |
| | **TOTAL** | | | | **$233,595.00** |
| **12** | **Buckhorn Road-Ogle Road to Hwy 321** | | | | |
| | 8' Wide Asphalt Trail | 5,475 | LF | $180.00 | $985,500.00 |
| | Pedestrian Bridge | 1 | Ea | $60,000.00 | $60,000.00 |
| | **TOTAL** | | | | **$1,045,500.00** |
| **13** | **Roaring Fork Road** | | | | |
| | 8' Wide Concrete Trail | 3,580 | LF | $350.00 | $1,253,000.00 |
| | Pedestrian Bridge | 3 | Ea | $60,000.00 | $180,000.00 |
| | **TOTAL** | | | | **$1,433,000.00** |
| | **Total All Segments** | | | | **$13,752,895.00** |
| | **10% CONTINGENCY** | | | | **$1,375,289.50** |
| | **TOTAL** | | | | **$15,128,184.50** |

## 4.5 PERMITS AND APPROVALS

In addition to any required City zoning, land use, and/or building permits and approvals, the following may be required for implementation of the trails.

- COE (and possibly TVA) 26A Permit for alterations to streams, wetlands, fill within TVA easements, etc.
- TDEC Notice of Intent for Construction Activity (required if a total over 1 acre is disturbed); Nationwide Section 404 Permits for minor crossings of streams; Aquatic Resource Alteration Permit for disturbance of streams and wetlands.
- Approvals for encroachment on utility easements.
- State Historic Preservation Office approval for disturbance of historic sites/ archaeological resources.
- For projects funded by TDOT Enhancement Grants, National Environmental Policy Act (NEPA) documentation is required. This normally consists of a Categorical Exclusion.

# 5.0 Grant Funding Opportunities

Implementation of the trail system should be undertaken on a phased approach, as described earlier in this report. The City should plan to apply for grant funding each year for each phase and include matching funds in its yearly budget. Funding sources for implementation of this plan can come from a variety of sources. This section explores these avenues.

## 5.1 TDOT Enhancement Grants

TDOT Enhancement Grant funding is the most common means of funding transportation enhancement projects. This funding source will pay for the construction of sidewalks, bicycle trails, lighting of trails, landscaping, enhancement/restoration of historic transportation facilities which are immediately connected to transportation facilities (rail depots, etc.). It can also be used for visitor's centers and trailheads. This funding is available from the federal government to local governments through application to the Tennessee Department of Transportation (TDOT). There is no limit to the grant amount; however, the amounts available are limited and competition is keen. Typical grants are in the $100,000–300,000 range; however, some communities have been successful in obtaining much larger appropriations. Enhancement grants require a 20% local match.

Political support is a key one obtaining these funds. You should inform your state senator and representatives as early as possible of your intent to apply for enhancement grant funding. Contacts with the Governor's office and the Commissioner of Transportation's office can also help.

## 5.2 Recreation Trails Program (RTP)

Recreational Trails Program grants may be used for non-routine maintenance and restoration of existing trails, development and rehabilitation, trailside or trailhead facilities such as restrooms, kiosks and parking lots, construction of new trails and land acquisition for recreational trails or corridors.

Federal, state and local government agencies may apply, as well as non-profit organizations that have obtained IRS 501(c)(3) status and have a written trail management agreement with the agency that owns the property where the trail project is located.

Funding for RTP grants is provided by the Federal Highway Administration through the federal Safe, Accountable, Flexible, Efficient Transportation Equity Act. The Department of Environment and Conservation administers this grant program for the state of Tennessee. The minimum grant request is $8,000 with a match of $2,000 for a total project cost of $10,000. Local community trail projects are limited to a maximum grant request of $80,000 with a match of $20,000 for a total project cost of $100,000.

In past years, planning grants were available to assist communities with completing planning studies for greenway systems. This study was funded in part by this program. The maximum grant amount under this program is $20,000 and requires a $5,000 local match.

## 5.3 LOCAL PARKS AND RECREATION FUND (LPRF)

The Local Parks and Recreation Fund (LPRF) is a State-funded grant program that can be used for trail and sidewalk projects. By and large, the funding available for trail and sidewalk projects is limited to those that have a direct correlation with other recreation facilities such as linking existing parks. LPRF funds could be used for construction of trailheads, shelters, picnic areas and other passive recreation facilities. LPRF grants require a 50% local match, although design fees can be paid for with the matching funds. While they have a formal scoring process that ranks requests, it is important to gain political support for the request.

## 5.4 SPECIAL APPROPRIATIONS

Some communities in Tennessee have been successful in obtaining special appropriations from the State and Federal governments for trail construction. This opportunity should be explored through State and Federal legislators.

## 5.5 SUMMARY

The downside of planning for construction based upon grant funding is the possibility that the grants will not be awarded in any particular year. It is recommended that a variety of funding sources be pursued for various phases. For example, enhancement grant funding could be pursued for virtually all portions of the system, LPRF for the primitive trails and those immediately adjacent to the Commons recreation facilities. Local, private, and special appropriation funding could be pursued for the balance of the system. In this way, the primary and most important components of the system would be funded by the most dependable source of grant funds.

# 6.0 Conclusion

This report has documented the process that was used to provide a proposed greenway network that will connect various nodes around the city of Gatlinburg. The mission of this plan, and the process leading up to it, is to provide long-term guidance to the city as funding opportunities become available. As the greenway system is initiated, the growing public interface with the network will hopefully fuel the demand for additional greenways and an improved overall quality of life for all.

# Appendix A

# Appendix B

## GREENWAY DESIGN STANDARDS AND CONSTRUCTION DETAILS

Following are general standards and recommendations for construction of greenways. Some of these considerations are shown on ***Figure 14***. It should be noted these standards are, in many cases, desirable but not mandatory.

### Trail Width

According to AASHTO (American Association of State Highway and Transportation Officials) standards, under most conditions, the recommended paved width for a two direction shared use path is 10 feet. Under certain conditions, a width of 8 feet is acceptable. In addition to the trail itself, a 2-foot wide shoulder with a maximum 1:6 slope should be maintained adjacent to both sides of the trail. Where the trail is adjacent to water bodies, ditches or side slopes steeper than 3:1, a wider separation should be considered. In this case, a 5-foot shoulder is desirable, and a physical barrier such as a rail or fence may be necessary, depending on the height of the adjacent embankment.

Bike lane standards are 5 feet in width preferred, 4 feet minimum, and can be added to the existing roadway system at a minimal cost when compared to the addition of a full-width shared-use pedestrian trail.

### Vertical Clearance

The vertical clearance to obstructions should be a minimum of 8 feet. However, this may need to be increased to permit passage of maintenance and emergency vehicles. In underpasses and tunnels, 10 feet of clearance should be maintained.

### Grades

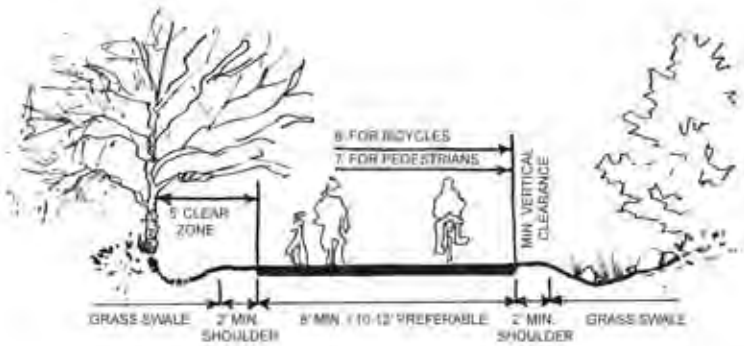
When possible, the grades, or slopes, of trails should maintain a maximum longitudinal slope of 5%. When steeper slopes are necessary, they should be kept to a minimum and perhaps should contain landings at certain intervals (see ADA Accessibility below).

The maximum allowable cross slope for a trail is 2%. Trails should not be crowned, but pitched in one direction to ensure positive drainage.

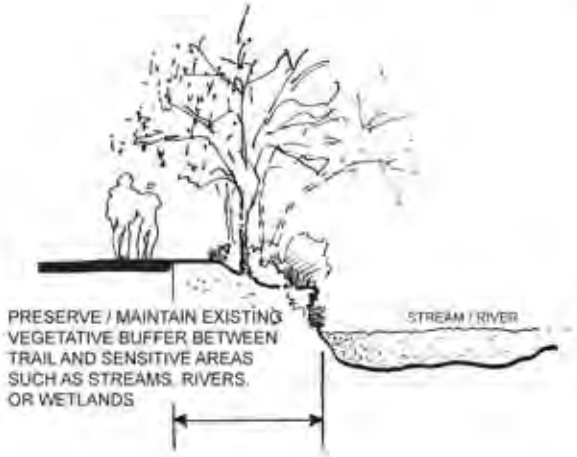
### Shoulders

All hard-surfaced trail shoulders should be constructed using the following criteria:

- All shoulders should be a minimum of 2 feet wide.
- Shoulders should be a minimum of 3 feet wide when adjacent to obstructions such as trees, fences, parking stalls, signs, or building facades.
- Recommended shoulder cross-slopes are a minimum of 2% and a maximum of 5%.



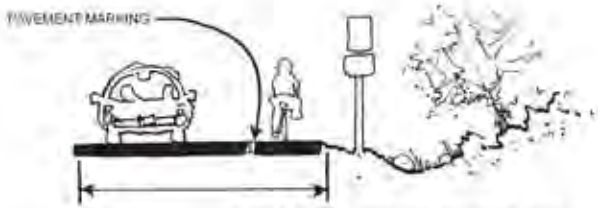

**TYPE 1 TRAIL** - SEPARATED RIGHT-OF-WAY





**TYPE 2 TRAIL** - DESIGNATED RIGHT-OF-WAY

SCREEN TRAIL FROM ADJACENT RESIDENTIAL




**TYPE 3 TRAIL** - SHARED RIGHT-OF-WAY

- Shoulders should consist of a porous material.
- Shoulder vegetation should be maintained at a height of 6 feet or less when practical.

**Surface Materials**

Asphalt is the most common paving material for hard surface trails, although trails can also be constructed of concrete or crushed material. When using asphalt, a 2-inch thickness of asphalt over a 6-inch crushed stone base is required. In all cases, a well compacted subgrade is necessary.

Concrete should be used in locations where the trail is frequently inundated with water, as in a floodplain. Reinforced concrete should be used in areas where the subgrade is unstable and prone to subsidence.

Packed crushed stone, gravel fines compacted with a roller, packed soil and other natural materials bonded with synthetic materials, can provide the degree of material stability and firmness that is required for ADA accessibility.

**ADA Accessibility**

All pedestrian trail projects are required to be planned and designed to comply with the "American Standard Specifications for making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped." In October of 2009, the United States Access Board published "Draft Final Accessibility Guidelines For Outdoor Developed Areas". These regulations cover campgrounds, trails, etc. located on federal outdoor sites, but will likely eventually regulate local and state government facilities as well.

To summarize, these regulations state that no more than 30% of the total length of a trail shall have a running slope steeper than 1:12 (8%). The running slope of any segment of a trail shall not be steeper than 1:8 (12%). Where the running slope of a trail is steeper than 1:20 (5%), the maximum length of the segment shall be:

200 feet for slopes between 1:20 and 1:12;

30 feet for slopes between 1:12 and 1:10;

10 feet for slopes between 1:10 and 1:8

At the end of each segment, a resting interval shall be placed, that is a minimum of 5 feet long, with a maximum slope of 1:40 if concrete, asphalt, or boards, and 1:20 if another surface.

For more information on these draft requirements, and to submit comments, go to the internet website at www.access-board.gov/outdoor/.

**Bridges**

There are several factors to be considered when determining the best option when a bridge crossing is required. Functional, aesthetic, and cost considerations are

among these factors. Bridges can either be built of wood, or can be pre-fabricated structures made of steel or concrete.

The aesthetic quality of bridges should be considered during the design process. Pedestrian and bicycle-traffic bridges can become a focal point to the user. The style choices include covered bridges, rustic, or any number of variations of contemporary styles.

1. The bridge should be located in a straight section instead of a bend or curve, preferably at a narrow point, to reduce cost.
2. Locate the bridge above the 100-year floodplain.
3. The interior clear span width of the bridge should be at least as wide as the approaching trail.
4. The minimum handrail height is 4.5 feet, in accordance with AASHTO standards. The top rails should be designed to discourage sitting, and a rub rail height of 3.5 feet is recommended.

### Road Crossings

Road crossings must be carefully planned and designed, as they present the most potentially hazardous part of the trail system. There are specific requirements for signage, sight distance, pavement markings, and access control that could differ for each individual crossing, depending upon the type of road to be crossed.

### Graphics and Signage

A comprehensive signage system that utilizes universal symbols is a necessity for a greenway system. A symbol or logo should be incorporated into the signage and should convey the atmosphere of the community. The logo can be used to help expand the user population and to gain public support and community identity.

### Regulatory and Warning Signs

The Manual on Uniform Traffic Control Devices (MUTCD), latest edition, covers most of the applications in which regulatory signs are required for greenways. In most instances, regulatory signs are used to inform the trail user of laws and regulations and to indicate the applicability of legal requirements not otherwise apparent. Additionally, regulatory signs indicate where something is mandated or where a prohibition begins or applies.

Warning signs are used to alert trail users of potentially hazardous conditions within or adjacent to the corridor. All regulatory and warning signs should meet the specifications of MUTCD. MUTDC does, however, provide for smaller than standard highway signs when used on trails.

### Guidance and Directional Signage

Information for trail users regarding location, orientation, location, and distance should be provided along trails. MUTCD provides guidelines for these types of signs, although customized signs can add character and continuity to the trail.

Information signs can address specific route identification, overall trail network, and directional changes in the trail. These signs can also be used for environmental education opportunities. Mile marker designations are also helpful to the user. These types of signs can also provide recognition of local jurisdiction participation and/or corporate/private sponsorships.

For more information on the MUTCD, and how signage applies to greenway networks, log on to their website at http://mutcd.fhwa.dot.gov.

## TRAIL AMENITIES

### Site Furniture

There are numerous items that can enhance the value and quality of the trail networks, as well as making the system more functional. These items include seating spaces, picnic tables, trash and recycling receptacles, bike racks, shelters, water fountains, and fitness equipment. Consistency and continuity of these elements will help to unify the trail network. One way of creating this connection is to choose furnishings that can be manufactured with Gatlinburg's logo incorporated. The following are some general considerations when selecting trail furnishings:

- Simple designs that require little maintenance are best. Durability and vandal resistance are vital.
- The use of suitable surface under furnishings will minimize maintenance.
- Mount all furniture in grade to provide durability and minimize vandalism. Set support posts a minimum of 18" below grade in concrete footings with a minimum of 6" of gravel below.
- Install furnishings in practical areas with views of the surrounding landscape and in areas with adequate shade.

### Seating

Provide seating spaces in areas with high volumes of use. Recommended seating height is 18"-20", but a range of seating heights will often allow flexibility for children and those with disabilities. In areas where elderly persons are likely to use the trail, furnishings with backs should be provided. Backless benches are less expensive, and should be situated so that they are not hazards to the adjacent trail users. Seating should be located outside the desired 6' clear zone along the trail's shoulder.

### Picnic Tables

Picnic tables are common elements along greenways, as they offer a surface suitable for a range of activities. Table tops should be open enough to allow water to drain through. Access for disabled trail users should be provided by utilizing tables with center supports, allowing wheelchair access on the ends. Vertical clearance should be 27" with 30" of lateral clearance to any part of the table. Trash

and recycling receptacles should be located in the immediate vicinity of the tables. Shelters over picnic tables are desirable but not necessary in every location.

### Trash / Recycling Receptacles

When locating trash and recycling receptacles, ensure that the locations are accessible to the area being served, while also meeting the necessary clearance requirements. Install the containers so that it will not be easily tipped over by the wind, animals, or vandals. A secure cover will provide protection from rain and minimize the presence of odor often associated with decaying food products. This is especially important in Gatlinburg, where black bears have been trapped and killed for rummaging through residential waste. Bear-proof trash receptacles should be utilized, and bear containers may be needed near shelters for temporary food storage. Materials should be consistent with the rest of Gatlinburg's park and trail amenities.

### Bike Racks

When selecting bike racks for trail use, avoid less expensive racks with sharp edges or corners, as they are often not utilized. Heavy-duty steel pipe, hot dipped galvanized after fabrication will provide the most durability. Racks constructed of lightweight steel tubing are not suitable due to the abuse inflicted by years of use. Bike lockers should also be considered in more dense areas, that protect bikes from harsh environmental forces as well as concealing the value of the bike contained.

### Landscape Design

When selecting plant materials for use along the greenway corridor, care should be taken to select trees and shrubs that are not heavily root invasive. Plant materials should be native or naturalized, require little maintenance, and be drought-tolerant. Plant selection should be dependant upon the microclimate of the area in which it is planted. Plants that are within low-lying areas or drainage areas should be suited to wet conditions. An arborist or landscape architect should be consulted prior to selecting new plant material for the proposed trail corridor. Plant material, when properly selected and located, can have a variety of functional and aesthetic uses, as described below:

1. Plants can block undesirable views or can be used as a sound barrier.
2. Plants can create physical barriers.
3. Plants blend with the natural environment.

## MANAGEMENT AND MAINTENANCE

The greenway system should be classified by the City as a linear park and should be formally maintained in a clean, safe, and usable condition like all other parks in the city. Greenway lands should be maintained in a natural condition to the largest extent possible, so that they may fulfill multiple functions including passive recreation, alternative transportation, storm water management, environmental and historical interpretation, and plant and wildlife habitat protection.

Planning for maintenance primarily involves a comparison of initial investment for construction versus long-term investment for maintenance. The selection of the trail route and type of construction greatly influences the cost for maintenance. For example, asphalt costs half as much as concrete but may last less than half as long. The initial planning should include a schedule of maintenance, estimated costs (and who will pay for them), and methods of accomplishment. Consideration should be given to long-term capital maintenance costs. Trail surfacing materials have varying costs and life spans. Signage will require replacement. Bridges, tunnels, furnishings (benches, etc.) last a long time but will require routine maintenance and will eventually need replacement.

Once the greenway system is built, a Management and Maintenance program should be adopted by the City of Gatlinburg which ensures the public's health and safety during use of the greenway system. Primary guidelines of this Management and Maintenance program are listed below:

- The greenways should be maintained similar to other parks in Gatlinburg, including the removal of debris, trash, and other foreign matter.
- Existing vegetation should occasionally be removed or trimmed back to maintain sightlines and eliminate safety hazards. Shrubs and understory should be clear cut at least 3 feet from the edge of the trail, and selective clearing of vegetation should be conducted between 3 to 10 feet of the trail edge. For safety reasons, pedestrians should have a minimum unobstructed sight distance of 50 feet. along the trail in each direction, bicyclists should have 150 feet.
- All trail surfaces should be maintained to remove or replace rough edges, severe bumps or depressions, cracked or uneven pavement and vegetation occurring in the tread of the trail.

**Tree Roots**

Existing tree roots can cause damage to trail surfaces. The root zones of significant trees should be protected during construction. In some cases, the trail may need to be field adjusted when conflict with trees occur, or a specimen tree may need to be moved or replaced. In situations where new trees are desired, they should be planted no closer than 4 feet from the trail edge.

**Safety and Security**

Bicycle safety courses or handouts should be made available to the greenway trail users as to minimize potential vehicular and pedestrian conflicts. Understanding basic rules of the road and who has the right-of-way could save lives. The new bicyclist "Bill of Rights", outlines the relationship of bike and vehicular roadway use.

While greenway design balances the naturalistic setting and buffers trail users from roadways, it can conflict with the implied sense of safety. Call boxes, periodic video surveillance, trail patrol (voluntary vs. paid) etc, can be provided if deemed necessary.