FINAL DRAFT

CHATTANOOGA URBAN AREA BICYCLE FACILITIES MASTER PLAN

April 2002

Hawkins Partners, Inc.

in association with
RPM & Associates
March Adams & Associates

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prepared by:

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Prepared for the Chattanooga Urban Area Metropolitan Planning Organization and the Chattanooga-Hamilton County Regional Planning Agency in cooperation with the U.S. Department of Transportation, Federal Highway Administration, Federal Transit Administration and the Tennessee and Georgia Department of Transportation

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Mayors	Bob Corker – Chattanooga, Tennessee Fred Pruitt – East Ridge, Tennessee Judd Burkhart – Ft. Oglethorpe, Georgia Jewell Coleman – Red Bank, Tennessee
City of Chattanooga Council	Ron Littlefield Sally Robinson
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Agencies	CARTA Tennessee Department of Transportation – Bicycle Coordinator Georgia Department of Transportation – Bicycle Coordinator Hamilton County Health Department – Cheryl Shouse Hamilton County Board of Education – Gary Waters Hamilton County Human Services Division – Scott Schoolfield City of Chattanooga Parks and Recreation – Jeff Moore City of Chattanooga Neighborhood Services Chattanooga Police Department, Police Bicycle Patrol – Daniel Anderson City of Chattanooga Traffic Engineering Department Chattanooga-Hamilton County Air Pollution Control Bureau Electric Transit Vehicle Institute Coosa Valley Development Center Federal Highway Administration Chickamauga and Chattanooga National Military Park Trust for Public Land Lula Lake Land Trust University of Tennessee Chattanooga – Cindy Pulliam
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Bike Shops	East Ridge Bike Shop River City Bicycles Suck Creek Bike Shop

Central City Bicycle Advisory Committee	John Porter	Carol Farmer
	Manuel Rico	Daisy Blanton
	Doug Erwin	Hugh Worthy
	Jay Oliver	May Sligh
	Jerry Faulkner	Bill Sligh
	Deby Bryant	Jason Stoogenke
	Cora Lanier	Doug Lee
	Finn Billie	Eric Buck
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	Chris Gilligan	PamGlaser
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	Dean Allison	John Bridger
	Peter Hetzler	Darrin Ledford
	Chris Newton	Rickie Hefren
	Jerry Hightower	Jim Hefren
	Alvon Riley	Wade Kelley
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	Jim Farmer	Jordan Hoffman
	Debbie Hightower	Bobby Wilbanks
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East Hamilton County Bicycle Advisory Committee	Eddie Rahm	Mical Duffey
	Durward Higgins	Roger Williamson
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	Harry Hodgdon	Taylor Heard
	Matt Hullander	W. Eric Lee
	Cheryl Shouse	Kyle L. Allen
	Garth Mansfield	
North Georgia Bicycle Advisory Committee	Tom Ingledew	Doug Lee
	Rick Wood	J. Olney Meadows
	Don Washburn	Paul Page
	Damon Hairston	Patrick H. Reed
	Jim Calloway	David Wegener
Public Meeting Participants	Total number of attendees for all public meetings was over 500	

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EXECUTIVE SUMMARY

Over the last decade, bicycling has increasingly gained legitimacy as a viable form of transportation. Cities across the country have chosen to create comprehensive transportation systems that include integrated bicycle facilities. These cities offer their citizens alternative choices to using their automobiles for all of their transportation needs and break the monopoly that the automobile has had on our streets for most of the last century.

Why should the Chattanooga Urban Area include bicycling as a component of their comprehensive transportation strategy? Because Chattanooga, like many other cities across the country, is facing increased healthcare cost, air pollution, traffic congestion and economic competition. Bicycling has warranted a second look because it is a convenient pollution-free mode of transportation that addresses these issues.

The desired outcomes of this plan as established by the Bicycle Task Force in 2001 are the following:

- Expand the multi-modal perspective of the Long Range Transportation Plan
- Establish bicycle projects that will address air quality issues
- Expand education and safety programs related to bicycling
- Provide incentives for the provision of bicycle amenities in conjunction with economic development projects
- Invigorate neighborhoods
- Incorporate transportation enhancement plans
- Involve local municipalities and citizens in the planning and development of the plan
- Enhance region's potential for recreation and bicycle use

This plan was developed over a seven month period from October 2001 through April 2002. The planning process involved significant public input through planned three public meetings and four Bicycle Advisory Committees (BACs). Each of these input opportunities are identified in Figure 1.1.

In an effort to facilitate public input, the region was divided into four distinct major planning areas. They included the following:

- Central City
- West Hamilton County
- East Hamilton County
- North Georgia

The public meetings provided an open forum to inform the public while also providing a place to receive input and feedback during the planning process. Two meetings were held within each of the major planning areas. The first was held in October. The format was a charrette where participants were asked to identify desired destinations and potential bicycle facilities within the major planning areas. The preliminary bicycle recommendations were presented at the second meeting, held in February, 2002. Comments about the plan were received at this meeting.

A Bicycle Advisory Committee (BAC) was established for each of the four major planning areas. The BACs were comprised of an average of ten community representatives from a cross-section of the community. Their charge was to guide the planning process and provide a conduit for disseminating information to the public. Three BAC meetings were held in each major planning area.

The final bicycle plan was presented on April 1, 2002 at a joint BAC/Public meeting.

The plan builds upon the 140 miles of the existing and previously planned greenways within the planning area. The recommended bicycle facility network provides a comprehensive multi-jurisdictional network of facilities that accommodates cyclists of various skill levels. The plan identifies 377.5 miles of additional facilities that are comprised of the following:

- 36 miles of Class I: Multi-use Paths (off-road trail separated from motorized traffic by open space or a structural barrier)

- 155 miles of Class II: Bike Lanes (separated lane 4-6' wide immediately adjacent to the vehicular travel lane)
- 186 miles of Class III: Bike Routes (a wide outside lane to accommodate both vehicles and bicycles)
- 0.5 mile of Special Facilities (bike racks on Incline Railway)
- Bicycle Parking

The plan addresses the four elements of successful bicycle programs. They include engineering, education, encouragement, and enforcement. These are often referred to as the “Four Es”.

The bulk of this plan addresses engineering: the provision of well designed, connected, safe and practical bicycle facilities. Related planning and engineering issues include land use, street network planning, access management, and roadway design standards. Education, encouragement, and enforcement involve a range of promotions, incentives, programs, and other initiatives, in order to maximize the benefits of the new bikeway facilities. A major public awareness campaign is incorporated as a part of these recommendations.

The plan outlines the following major steps:

- Provide safe, convenient bicycle facilities
- Institutionalize bicycling within all aspects of the community
- Make bicycling an attractive option
- Ensure that growth occurs in a manner that is conducive to cycling
- Maintain bicycle facilities built
- Monitor progress
- Assure funding for facilities and programs

The planning horizon for this plan is twenty years. The bicycle facility recommendations have been divided in three priority phases that span this time period. The phases are identified in the following:

- Priority One = 62 total miles of bike facilities, including:
  - 0 miles of Class I
  - 24 miles of Class II
  - 38 miles of Class III
- Priority Two = 114.5 total miles of bike facilities, including:
  - 13 miles of Class I
  - 50 miles of Class II
  - 51 miles of Class III
  - 0.5 mile of Special Facility (bike racks on Incline Railway)
- Priority Three = 201 total miles of bike facilities, including:
  - 23 miles of Class I
  - 81 miles of Class II
  - 97 miles of Class III

Over the twenty-year period, the recommended improvements are expected to cost $24,586,677.00.

Even with the enormous benefits bicycling offers, its adoption has been slow and remains marginalized within most American cities. The major reason for this is that it requires a major cultural shift from the automobile as the sole means of transportation. This shift must take place on an individual level as well as a political level. For cities to reap the many benefits of bicycling, it must be institutionalized within the psyche of the entire community.

As the Chattanooga Urban Area continues to grow and prosper over the next 25 years, it has chosen to integrate bicycle facilities as a part of its transportation strategy. This is not an easy task. This plan provides a clear course of action that, if implemented, can produce the required culture shift that will make the urban area a bicycle-friendly community.

The transformation will not happen overnight. It will require a strong commitment from everyone involved. The desired outcomes of this plan can be achieved. The Chattanooga Urban Area will reap the many benefits that bicycling offers and ultimately sharpen its competitive edge. This plan is the first step.

INTRODUCTION

Over the last decade, bicycling has increasingly gained legitimacy as a viable form of transportation. Cities across the country have chosen to create comprehensive transportation systems that include integrated bicycle facilities. These cities offer their citizens alternative choices to using their automobiles for all of their transportation needs and break the monopoly that the automobile has had on our streets for most of the last century.

Why should the Chattanooga Urban Area include bicycling as a component of their comprehensive transportation strategy? Because Chattanooga, like many other cities across the country, is facing increased healthcare costs, air pollution, traffic congestion and economic competition. Bicycling has warranted a second look because it is a convenient pollution-free mode of transportation that addresses these issues.

Even with the enormous benefits bicycling offers, its adoption has been slow and remains marginalized within many American cities. The major reason for this is that it requires a major cultural shift from the automobile as the sole means of transportation. This shift must take place on an individual level as well as a political level. For cities to reap the many benefits of bicycling, it must be institutionalized within the psyche of the entire community.

As the Chattanooga Urban Area continues to grow and prosper over the next 25 years, it has chosen to integrate bicycle facilities as a part of its transportation strategy. This is not an easy task. This plan provides a clear course of action that, if implemented, can produce the required culture shift that will make the urban area a bicycle-friendly community.

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Benefits of Bicycling

Health Benefits. Americans are more sedentary than ever. Almost 73% of adults are not active enough. The health benefits of bicycling to improve aerobic activity are substantial. Exercise has been proven to be effective in improving cardiovascular health and reducing strokes and other chronic diseases. While a formal exercise program is not practical for all individuals, reducing sedentary activities and substituting bicycling for recreation or transportation would provide significant health benefits. Incorporating bicycling into a daily routine is also time-efficient, as both travel and exercise are accomplished simultaneously.

Another health benefit of bicycling is weight loss. Exercise contributes to decreasing appetite and increasing lean body weight. One consequence of Americans' dependence on their cars is decreased physical activity and higher levels of obesity. The Center for Disease Control (CDC) reported in the Journal of American Medical Association that the United States has the highest obesity rate of any industrialized nation. Tennessee's obesity rate has nearly doubled in the last 10 years increasing from 12.1% in 1991 to 22.7% in 2001. Obesity and inactivity account for nearly 300,000 premature deaths each year. Bicycling, a relatively low-impact activity, is a good choice of exercise for obese persons, who place great stress on the skeletal and muscular systems in high-impact activities.

Bicycling, as with other forms of exercise, has been shown to enhance mental health by reducing tension and anxiety. Further, increased

Health Facts:

- *73% of adults are not active enough*
- *22.7% of Tennesseans are obese*
- *300,000 premature deaths a year are contributed to inactivity and obesity*

Source: Center for Disease Control

physical activity improves the quality of life in terms of greater functionality in later years and longer life span.

Other health benefits of exercise include a decreased total level of cholesterol, increased muscular strength and reduced blood pressure resulting from weight loss and reduced stress.

Although there is some risk of accident involved with bicycling, there is enough evidence to support a favorable risk/benefit ratio compared to other recreational activities.

General Transportation Benefits. Besides providing an alternative travel option for those who cannot or choose not to drive, bicycling contributes several benefits to the general transportation system.

The incorporation of bicycle facilities into a transportation plan necessitates improvements to existing roadways, thereby increasing safety for motorists as well as cyclists and pedestrians. For example, the addition of paved shoulders has been shown to reduce the frequency of certain types of motor vehicle accidents. Roadway improvements can also increase roadway longevity and save in maintenance costs. "Traffic calming" techniques, which may be included in a bicycle facility plan, can be beneficial in slowing vehicle speeds, further reducing the frequency of accidents. The transportation system is enhanced when greenways and off-road trails are provided. These corridors improve linkages between destinations such as schools, parks and shopping.

Some alleviation of traffic congestion may occur as a result of increased use of alternative transportation modes. Bicycles require less space per traveler than automobiles in terms of road space and parking requirements.

Environmental Benefits. Motor vehicles are the main source of noise and air pollution in the United States. Increased use of non-motorized transportation like bicycles would result in significant benefits to the quality of our environment.

Motor vehicle trips are the least fuel-efficient and most pollutant-producing form of travel. Carbon monoxide emissions from motorized vehicles can be as high as 90 percent of all emissions in urban areas. Though Chattanooga has come far in cleaning up its air, it still ranks 25th in a list of America's most ozone-polluted cities, according to a study by the American Lung Association. Total urban air pollution is responsible for at least 50,000 additional respiratory illness cases per year nationally.

Decreasing dependence on the automobile has the additional benefit of reducing the environmental impacts of drilling, refining, transporting, storing and disposing of petroleum products.

Nationally, less expenditures for road construction and maintenance are required as a result of the increased use of bicycling as a transportation alternative.

Economic Benefits. Increased levels of fitness have helped reduce health care costs for both individuals and on public service providers.

Nationally, less expenditures for road construction and maintenance are required as a result of increased use of bicycling. Individuals may benefit from logging less miles on their vehicles and potentially reducing the number of vehicles per household.

Many people cannot afford a vehicle or choose not to have a car. Bicycling offers these people a viable independent travel option. According to the American Automobile Association, the cost of operating a vehicle is about $5,170 a year, while operating a bicycle for one year has been estimated by the League of American Bicyclists to cost about $120.

Public savings are further realized through reduced pollution abatement and oil import costs. In 1990, commuting by bicycle saved the United States 17 million barrels of oil.

Additionally, bicycle facilities contribute to enhanced quality of life and are considered attractive to potential new residents as well as businesses which promote wellness/ fitness. The provision of greenways can result in an increase in property values in addition to providing corridors for transportation.

Outside Magazine named Chattanooga in its 2001 "Best Places to Live" issue.

Additional Benefits. Other potential benefits of bicycling include promotion of community cohesiveness and an enhanced sense of neighborhood by increasing and encouraging personal contact.

Desired Outcomes

The desired outcomes of this plan as established by the Bicycle Task Force in 2001 are the following:

- Expand the multi-modal perspective of the Long Range Transportation Plan
- Establish bicycle projects that will address air quality issues
- Expand education and safety programs related to bicycling
- Provide incentives for the provision of bicycle amenities in conjunction with economic development projects
- Invigorate neighborhoods
- Incorporate transportation enhancement plans
- Involve local municipalities and citizens in the planning and development of the plan
- Enhance region's potential for recreation and bicycle use

The purpose of the Chattanooga Urban Area Bicycle Facilities Master Plan is to provide a guide for the location and orderly development of safe bicycle facilities that serve transportation needs between residential neighborhoods and commercial, educational, civic and recreational activities. The specific goals of this plan as established by the Bicycle Task Force are as follows:

- To identify locations for bicycle facilities that will enhance existing and future land use development
- To provide for practical transportation linkages that are safe and functional for all users whether they are novice or skilled in bicycle use
- To provide for bicycle facilities that provide safe linkages with other modes of transportation and that enhance the design of existing neighborhoods as well as future neighborhoods
- To retrofit, where appropriate, existing streets with standard signage, lane markings, and traffic control devices for safe use by bicyclists
- To provide for an orderly installation of bicycle facilities in coordination with the infrastructure plans of public and private organizations engaged in community development
- To involve key stakeholders and interested citizens in the development of the master plan
- To educate and promote safety practices by bicyclists in cooperation with existing local educational and safety programs
- To increase bicycling trips for non-recreational travel
- To coordinate bicycle facilities with plans for trails, sidewalks, and other pedestrian facilities in order to complement them

Planning Process

This plan was developed over a seven month period involving the following tasks:

- Task1: Project Initiation
- Task2: Inventory and Analysis
- Task3: Preliminary Bicycle Master Plan
- Task4: Final Bicycle Master Plan

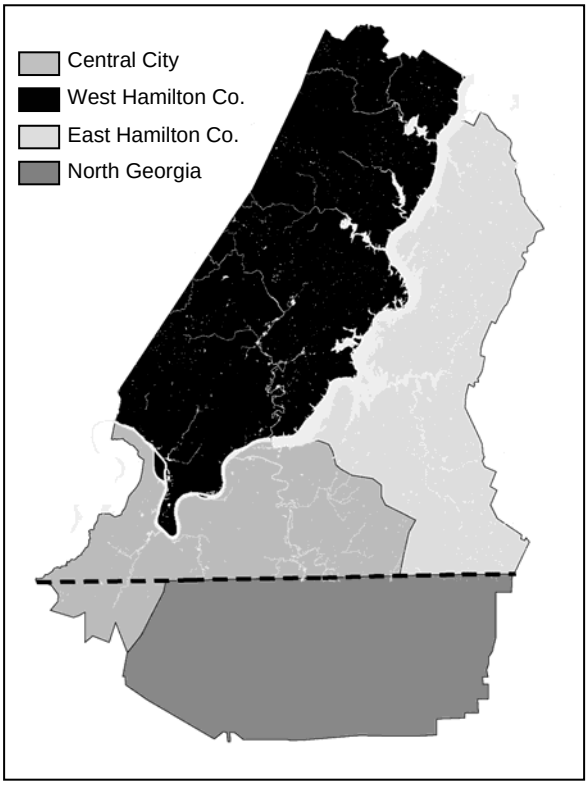
Figure 1.1 illustrates how these tasks fit together.

The planning process involved significant public input through planned public meetings and a Bicycle Advisory Committee (BAC). Each of these input opportunities are identified in Figure 1.1.

In an effort to facilitate public input, the region was divided into four distinct major planning areas. They included the following:

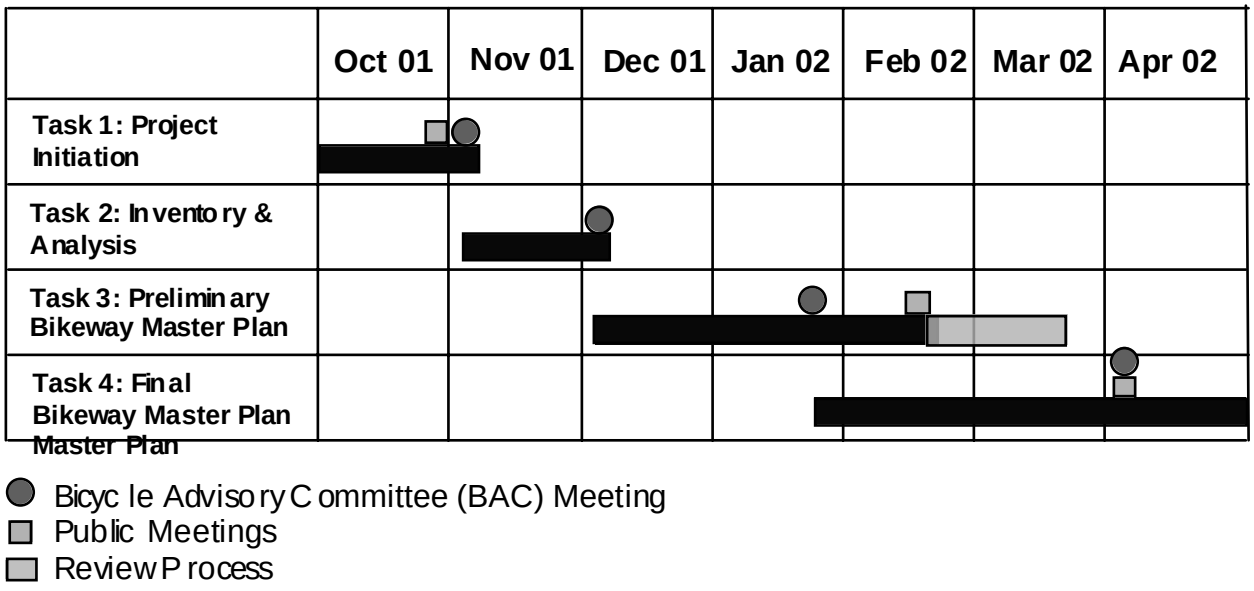
- Central City
- West Hamilton County
- East Hamilton County
- North Georgia

The *Central City Planning Area* includes the majority of the Chattanooga Urbanized Area, East Ridge, and Lookout Mountain (TN and GA).



Major Planning Areas

Figure 1.1
PLANNING PROCESS



The *West Hamilton County Planning Area* includes the north portion of Chattanooga, Red Bank, Signal Mountain, Soddy Daisy, Walden and Lakesite.

The *East Hamilton County Planning Area* includes a small portion of East Chattanooga, Collegedale and Ooltewah.

The North Georgia Planning Area includes Chickamauga, Rossville, Ft. Oglethorpe and Ringgold.

The public meetings provided an open forum to inform the public while also providing a place to receive input and feedback during the planning process. Two meetings were held within each of the major planning areas. The first was held in October. The format was a charrette where participants were asked to identify desired destinations and potential bicycle facilities within the major planning areas. The preliminary bicycle recommendations were presented at the second meeting, held in February, 2002. Comments about the plan were received at this meeting.

A Bicycle Advisory Committee (BAC) was established for each of the four major planning areas. The BACs were comprised of community representatives from a cross-section of the community. Their charge was to guide the planning process and provide a conduit for disseminating information to the public. Three meetings were held in each major planning area.

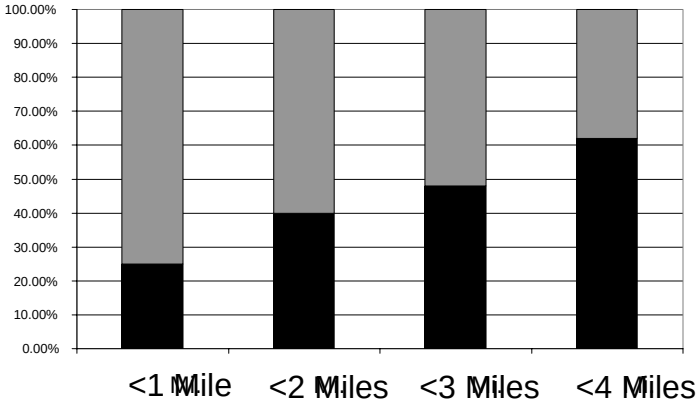
The final bicycle plan was presented in early April, 2002 at a joint BAC/Public meeting.

Transportation Demographics

In 1990, the Federal Highway Administration published the Nationwide Personal Transportation Survey (NPTS). The report provided a snapshot of the public's transportation habits.

According to the survey, only one out of five trips for all modes of travel involves travel to or from the workplace and less than two percent are related to on-the-job travel. The largest percentage, almost 42 percent, of daily trips are made for personal or family reasons such as trips to the grocery store,

Public Charrette in October 2001



Average Distance of Trips
Source: National Transportation Survey, 1995

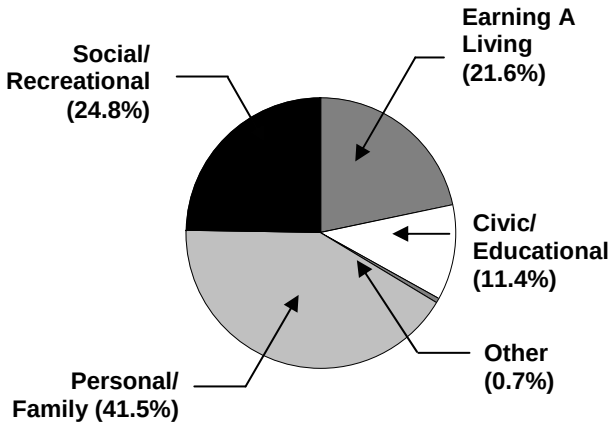


Figure 1.3
Purpose of Daily Trips For All Modes of Travel
Source: National Transportation Survey, 1995

medical appointments, or transporting a child to school. The next largest portion of trips involves social or recreational travel, including social visits, entertainment-related trips and vacation travelling. The study further revealed that of these trips, only 0.7 percent are made by bicycling.

The survey revealed that the average length of a bicycle travel trip was 2 miles. Most of the trips were made in central city areas, which have higher densities and compaction than suburban and rural areas.

The NPTS further indicated that the average length of a travel trip for all transportation modes is 9 miles. Trips to the workplace are slightly longer, while shopping and other utilitarian trips are shorter. In Chattanooga, vehicle miles traveled (VMT) have doubled since 1984 due to residents moving to outlying areas. The average worker in Hamilton County commutes 21.6 minutes to work.

Nationally, 27 percent of travel trips are 1 mile or less, 40 percent are 2 miles or less and 49 percent are 3 miles or less. All of these trips are of reasonable biking distance. In the United States, less than one percent of all commuters used a bicycle to travel to work regularly. While approximately 27 percent of all trips are less than one mile, 75 percent of those are taken by car.

When choosing to ride a bicycle for non-recreational travel, people are typically willing to travel 2 miles. This constitutes an approximately 10-20 minute ride depending on traffic and the physical abilities of the rider. Since 43% of the trips currently taken by car are two miles or less, there is the opportunity to bicycle for a portion of these trips.

Barriers to Bicycling

Given that people are willing to bicycle two miles or less for non-recreational travel, and with all of the benefits bicycling can offer, why does bicycling continue to remain a marginalized form of transportation within most American cities. The major reason is that increasing bicycle use requires a major cultural shift from the notion of the automobile as the sole means of

International Perspective: Percentage of Trips Made By Bicycle

Netherlands	29%
Denmark	18%
Finland	12%
Germany	11%
Sweden	10%
Norway	<10
United Kingdom	2.5%
United States	0.7%

National Perspective Beyond Chattanooga

Top 5 Negatives Factors Influencing Cyclist's Decision For not Commuting By Bicycle

Don't want to ride in the rain	75%
Sweat Factor	62%
Too Much Traffic	60%
Too Dangerous	53%
Takes Too Long	51%

Top 5 Negative Factors Influencing the General Public's Decision For Not Commuting By Bicycle

Don't want to ride in the rain	85%
Takes Too Long	79%
Sweat Factor	75%
Too Much Traffic	75%
Too Dangerous	71%

Source: Noland, Robert B. 1992. The Role of Risk in Policies to Promote Bicycling

transportation. The dominance of the automobile can be seen in the design of our roads and in the places we live. It can be seen in the individual choices that we make everyday.

A brainstorming session to discuss obstacles to bicycling was held during the first Bicycle Advisory Committee meeting. This meeting provided a clearer picture as to why bicycling has not gained greater significance as a mode of transportation within the study area. The following is a summary of the discussion.

Overwhelmingly, the BAC members felt that the foremost obstacle hindering bicycling was that people feel uncomfortable biking on the existing road system. The reasons include the following:

- Too many cars on the road
- The roads are too narrow
- Traffic is moving too fast
- Sight distances are inadequate
- Storm grates are not bicycle-friendly
- Drivers are hostile to cyclists
- Lack of street lighting
- Debris in road shoulders
- Rumble strips in the shoulders

Furthermore, BAC members felt that many people perceived cycling as an inconvenient means of transportation. The perception is that it takes longer to get to a destination by bicycle than by automobile. Adding to this inconvenience is the perception that bicycles do not offer adequate space to carry items such as groceries and briefcases.

Compounding the issue is the scarcity of bicycle facilities. They either do not exist or, if they are present, they are not consistent. These facilities include:

- On-Road Bikeways (Bike Lanes, Bike Routes)
- Signage
- Greenways
- Bike Racks
- Showers

BAC members described numerous experiences that underscored the perception that a majority of drivers do not recognize cyclists as having the right to be on the road. The BAC felt that this added to the hazardous atmosphere most people feel while cycling on the road. It was pointed out that drivers are uncomfortable with cyclists because many cyclists do not follow traffic laws, travel at a much slower speed and can be unpredictable.

The lack of information for people interested in choosing to bicycle was considered an obstacle. People who wanted to bike did not know how to get to their destinations safely. No maps were available. There was also a lack of educational information to teach teens and adults about bicycling as a transportation alternative. Some participants pointed out that this information is available, but many potential bikers do not know where to find it.

Climate has always been an obstacle to bicycling. BAC members felt that many people are either uncomfortable during the summer because of high temperatures and humidity or in the winter because it is too cold. Precipitation is a further deterrent to cycling. Shorter days in the winter were identified as an obstacle for people commuting to work.

Barriers to Cycling

- *Riders uncomfortable on road*
- *Perceived as Inconvenient*
- *No bicycle facilities*
- *Lack of Information*
- *Climate*
- *Driver's and cyclist not following "Rules of the Road"*
- *Not adequate physical condition*
- *Topography*
- *Land use pattern*

Source: Chattanooga BAC Meetings

BAC members pointed out that people who are capable of riding often convince themselves that they are not in adequate physical condition to use bicycling as a mode of transportation, or that they cannot climb the hills along their route.

Geographical obstacles were identified as significant barriers to bicycle travel. The Chattanooga Urban Area's topography is rugged. The area is surrounded by steep mountains and ridges run north-south throughout the planning area. Traversing these obstacles can be difficult even to a well-conditioned cyclist. The Tennessee River is another significant geographical barrier. There are few bridges crossing the river and many of them do not provide adequate access for bicycles.

These geographical barriers have been overcome by the existing transportation system by providing tunnels and bridges. The BACs pointed out that these facilities have typically not considered bicycling in their design. Many tunnels and bridges are narrow and are extremely dangerous to cyclists.

Land use patterns were identified by the BACs as another factor in the low rate of bicycle use for transportation. They pointed out that the distance between where the population lives and where they need to go are too far apart.

In a discussion of recreational riding, the BACs felt that there were few places within the planning area to ride their bikes. Specifically, BAC members noted an extremely limited list of locations for family riding. The primary family cycling location noted in all BAC meetings was Chickamauga National Battlefield.

History of Bicycling Efforts in the Chattanooga Urban Area

It has been a long road in nearing the culmination of this plan. Over the last thirty-three years, many of the area's citizens have been working toward raising the profile of bicycling and ultimately integrating it within the current transportation strategy.

The year 1967 was a big year for the bicycling initiative in Chattanooga. During this year the first Bicycle Club meeting was held and the first bike route in Tennessee was designated. The first route was called the Brainerd Bikeway. It was located on Moore Road between Shallowford and Old Mission Roads, and North and South Terracec flanking the interstate. In 1968, the City designated May as "Bicycle Month".

In 1980, the City of Chattanooga completed a Comprehensive Bicycle Plan, which was updated in 1983. Bicycle planning efforts were dormant for over a decade when, as a part of the 1995 Long Range Plan, a series of meetings were held to develop goals and objectives for increasing bicycling within the City. The goals included the following:

- Increase public awareness of bike riding and increase motorists' awareness of bicyclists' legal right to use the roadway
- Increase ridership by developing routes that are safe and enjoyable to ride
- Meet the needs of the commuter, recreationalist and touring bike riders
- Link the bike route to other projects to increase its benefit (Greenways, Tennessee River Park, Walnut Street Bridge)
- Provide a link to North Georgia connecting to the Chickamauga Battlefield and other routes located in that area
- Develop a route with entrances and exits to the north, south, east and west of Hamilton County for easy passage through the area
- Obtain funding for actual bike trail projects
- Create specific routes with signage in accordance with American Association of State Highway and Transportation Officials (AASHTO) standards

In 1996 the Bicycle Task Force was organized as recommended by the 1995 Long Range Plan. The Task Force's mission was to devise a bicycle plan and programs to facilitate and promote the safe use of bicycles as a viable mode of transportation and recreation for all ages and skill levels.

The task force established the following objectives for carrying out its mission:

- Promote connections between land uses via bike facilities connecting neighborhoods

to schools, employment centers, recreation, and shopping areas

- Promote education for bicyclists, pedestrians, and motorists about their proper relationship in traffic
- Identify and seek support, both monetary and political, for bike initiatives
- Encourage maintenance of roadways to eliminate hazards to cycling
- Integrate bicycling into the transit system
- Promote the renovation of existing roads and bridges and the design of new provisions to facilitate safe cycling
- Promote the establishment of bike facilities in conjunction with Greenways
- Promote the construction of terminal facilities for bicycles

The Task Force organized bicycling events such as Bike to Breakfast in 1996 and continued this program until 2001 when they introduced the successful Bike It and Like It Program. The program involved several monthly events for biking to work.

In 1998, the Task Force successfully acquired funding to develop engineering documents for the North-South Corridor, which included continuous bicycle facilities between the Tennessee Aquarium and the Incline Railway. The Task Force submitted funding requests to the Metropolitan Planning Organization (MPO) for this Bicycle Master Plan and various bicycle projects.

In June of 2000, the Chattanooga Urban Area 2025 Transportation Plan was published. It recognized bicycling as an important component of the area's future transportation strategy. It recommended that bike lanes be included on all new road construction and that new bikeways and greenways be identified through the development of a comprehensive bicycle master plan.

Current annual events include the Bike It and Like It Program and the Bicycle Rodeo held at Coolidge Park. Many of the current education programs focus on youth related cycling and safety.

2001 Bike It and Like It Program

The Setting

The Chattanooga Urban Area encompasses nearly 780 square miles and is home to 380,000 people. The area includes all of Hamilton County and a portion of North Georgia. As discussed earlier, the planning area was divided into 4 major planning areas (Figure 1.4). Characteristics of each are described below.

Central City. The Central City Planning Area includes the majority of the Chattanooga Urbanized Area, East Ridge, and Lookout Mountain (TN and GA).

The area is characterized by medium to high-density neighborhoods paralleling the major arterials that lead to Downtown Chattanooga. The major transportation corridors are bordered with a mix of commercial types.

The largest concentrations of employers and commercial uses are Downtown and the Hamilton Place Shopping Mall area. A secondary concentration can be found in the St. Elmo area near the Incline Railway. Some of the area's largest industrial/manufacturing employers can be found northeast of Downtown along Amnicola Highway. It should also be noted that The University of Tennessee-Chattanooga is located just east of Downtown with a student population of approximately 7,000.

Over the past decade there has been a considerable increase in quality hotel space, office development and restaurants as the City of Chattanooga has focused revitalization efforts Downtown. An increase in the residential population Downtown has also increased the demand for bicycle facilities. These trends are expected to continue.

Major geographic features that pose considerable barriers to bicycling include the Tennessee River to North, Missionary Ridge to the east and Lookout Mountain to the west.

The Tennessee River restricts movement between the Central City Planning Area and the West Hamilton County Planning Area. The areas are linked by several bridges. The most notable of these is the Walnut Street Bridge, a pedestrian/bicycle-only bridge that connects Downtown with the North Shore Area.

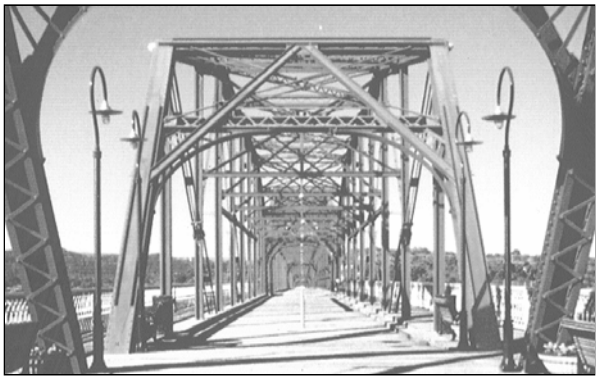
Lookout Mountain separates the Town of Lookout Mountain (TN and GA) from the rest of the planning area. There are a limited number of ways to traverse the mountain above grade. All of the options include extremely steep slopes.

Missionary Ridge cuts through North Georgia and the Central City Planning Areas. It is located just a few miles east of Downtown Chattanooga. Many of the roads crossing the ridge have narrow tunnels making the inclusion of bicycle facilities difficult or impossible.

Major geographic features that provide opportunities for incorporating bicycling include the Tennessee River, South Chickamauga Creek, and Chattanooga Creek. All of these corridors have been designated for greenway development.

The Tennessee River Walk and the South Chickamauga Greenway are the only major bicycle facilities present currently within the planning area. These have been developed over the last decade through the City of Chattanooga and the Trust for Public Land.

West Hamilton County. The West Hamilton County Planning Area includes the north portion of Chattanooga, Red Bank, Signal Mountain, Soddy Daisy, Walden and Lakesite.



Walnut Street Bridge

This area is primarily characterized by residential uses. Commercial uses have continued to increase due to the growth in the residential population. The southern portion of the planning area is denser. Densities decrease as development moves north. The majority of the northern half of the planning area is rural. The largest concentrations of commercial uses can be found at the Northgate Mall area, along the North Shore of the Tennessee River across from Downtown Chattanooga and along Hixson Pike. Secondary commercial nodes can be found along the major arterials of each of the communities that make up the planning area.

The surge in super shopping centers, "big box" retail, and restaurants over the last few years is expected to continue particularly within the southern half of the planning area. As the population has migrated further north into the Soddy Daisy area, commercial development has moved with it to meet the demand. This trend is expected to continue.

Moccasin Bend, west of the North Shore area, has been designated as a National Historic Site. It is expected to be an added draw for the nearly 1 million tourists who visit the Chickamauga Chattanooga National Military Park.

Major geographic features that pose considerable barriers to bicycling include the Cumberland Escarpment, the Tennessee River and a series of ridges running north-south between Red Bank and the Tennessee River.

The Cumberland Escarpment separates Signal Mountain from the rest of the planning area. There are a limited number of ways to traverse

the mountain. All of the options include extremely steep slopes.

The Tennessee River restricts movement between this area and the Central City Planning Area. The areas are linked by a series of bridges.

A series of ridges running north-south through the planning area limits east-west movement. The ridges serve to channelize movement along Dayton Road, Highway 27, Highway 158 and Hixson Pike.

Major geographic features that provide opportunities for incorporating bicycling include the Tennessee River and North Chickamauga Creek. These corridors have been designated for greenway development.

The only bicycle facilities present currently in the planning area are located along the developed segment of the North Chickamauga Greenway at the mouth of North Chickamauga Creek and Coolidge Park.

East Hamilton County. The East Hamilton County Planning Area includes a small portion of East Chattanooga, Collegedale and Ooltewah.

This area is primarily characterized by low-density residential uses. Major concentrations of commercial uses can be found within the heart of Collegedale and Ooltewah. The southern half of this planning area is the fastest growing residential area within the planning area. The trend is expected to continue for the foreseeable future. The majority of the northern half of the planning area is rural.

White Oak Mountain and the Tennessee River pose the greatest geographical challenges to bicycling within the planning area. White Oak Mountain runs north-south between Ooltewah and Collegedale, limiting east-west bicycle movement within the planning area. The Tennessee River cannot be crossed within this planning area.

Wolftever Creek and the Tennessee River offer opportunities to incorporate bicycle facilities. A small portion of Wolftever Creek in Collegedale currently has a greenway along its banks. An expanded greenway system is planned along other segments of Wolftever Creek.

North Georgia. The North Georgia Planning Area includes Chickamauga, Rossville, Ft. Oglethorpe and Ringgold.

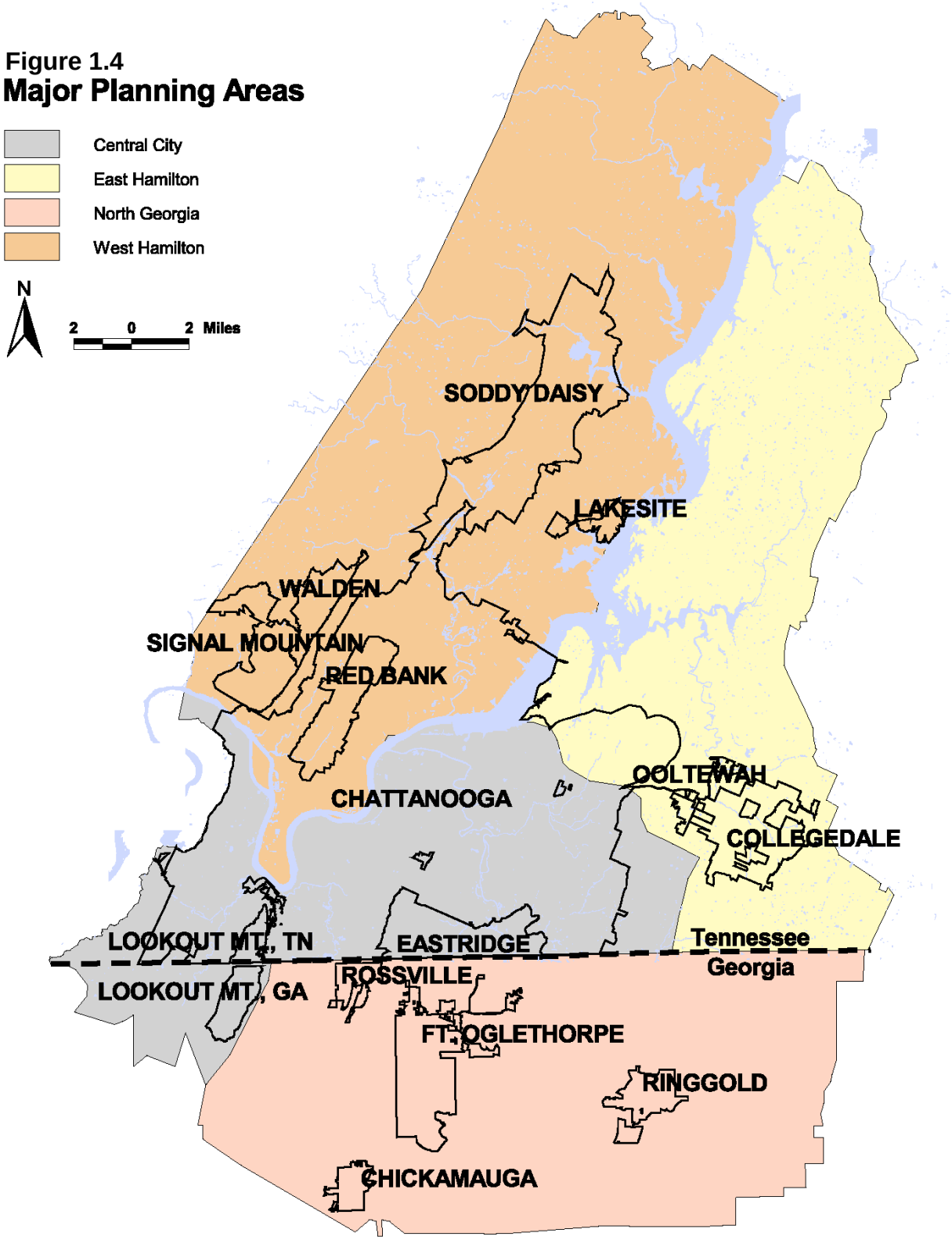
The area, which parallels the Tennessee-Georgia border, is characterized by low-density residential development. The largest concentration of commercial development is found within Ft. Oglethorpe. The southern portion of the planning area is rural. The Chickamauga National Battlefield dominates the central portion of the planning area. It attracts users from the Chattanooga Urban Area and beyond. It is a significant tourist attraction.

This area is the second fastest growing area within the Chattanooga Urban Area. The increase in residential uses is expected to continue to dominate land use patterns for the foreseeable future. Shopping-related trips will steadily increase as more people move to this area.

Topography is the most significant geographical barrier to bicycling within the planning area. The ridges and valleys run north-south through the planning area, making it difficult to travel east-west by bicycle.

Major geographic features that provide opportunities for incorporating bicycling include Chattanooga Creek and South Chickamauga Creek. These corridors have been designated for greenway development.

Figure 1.4
Major Planning Areas



INVENTORY AND ANALYSIS

In October of 2001, the first BAC and Public meetings were held. During these meetings, participants were asked to identify desirable destination and potential roads for bicycle facilities. The information that was gathered at these meetings provided a starting point for the planning process. The following information was collected and analyzed for its impact on bicycling.

Trip Generators & Attractors

The purpose of the bicycle and pedestrian network is to provide a comprehensive network of bicycle facilities that connect the local population to desired destinations. These desired destinations are referred to as trip generators and attractors. With the help of the public and the BACs, generators and attractors were inventoried during the planning process. They included the following:

- Public and private schools
- Universities and colleges
- CARTA park-and-ride facilities
- Bus system
- Recreation centers
- Parks
- Government offices
- Libraries
- Stadiums and theaters
- Post offices
- Hospitals
- Churches
- Major employers (>100 employees)
- Shopping centers and commercial areas
- Subdivisions

Figure 2.2 illustrates the location of large concentrations of attractors and generators.

Existing Road Inventory

Once the generators and attractors were identified, existing roads that provide important linkages were identified during the first public meetings and BAC meetings. The planning team identified additional roads for potential use as bike routes. The list in Appendix A was compiled by the planning team and inventoried. After driving over 1,000 miles of roadway, 621 miles of roads were inventoried. The key aspects of each segment that was inventoried include the following items:

- Width of travel lanes
- Number of travel lanes
- Presence of turn lanes
- Presence of shoulders and their width
- Presence of parallel parking and its width
- Posted speed limit
- Presence of curbs and gutters
- Presence of storm grates and bike "friendliness"
- Presence of street lighting
- General slope (level, moderate, steep)
- Presence of ditches

Suitability of Existing Roads

The existing roads identified as potential routes were analyzed for their suitability for accommodating bikeway facilities. Each route was evaluated on the following criteria:

- The ability for the existing roadway width to accommodate bikeway facilities
- Slope of the roadway segment
- Number of vehicles on the road each day
- The posted speed limit
- Sight distances along the roadway segment
- Significant barriers to bikeways (i.e. bridges, tunnels)
- Presence of on-street parking
- Number of intersections and/or curb cuts
- Presence of street lighting
- Cost of implementation of bikeway facilities
- Identified to be improved in the TransPlan 2025
- Importance as a connection to generators and attractors
- Continuity of segment
- Number of people served by the segment
- Aesthetics

The numeric ratings assigned to each of these criteria can be found in Appendix B, along with each segment's rating for each category. The segment's ratings were totaled and then aggregated to determine their suitability for bikeway facilities. Each segment was assigned to one of the following categories:

- Most suitable
- More suitable

- Suitable
- Less suitable
- Least suitable

Of the 621 miles of road that were inventoried, 7 percent were identified as most suitable, 24 percent were identified as more suitable, 36 percent were identified as suitable, 26 percent were identified as less suitable and 7 percent were identified as least suitable.

The suitability assessment provides a means of identifying the segments of roads that have potential for including bicycle facilities. Because it also includes intangible factors like connection and population served, it also identifies roads that are more desirable because of their importance to the network. Roads that are shown suitable or better, but currently do not have adequate width for bicycle facilities were further investigated for what modification could be made to the roadway segment in order to safely accommodate bicycle facilities.

The assessment was one factor in ultimately determining if bicycle facilities should be included on a specific roadway segment.

Figures 2.5-2.8 identify roads inventoried and their associated suitability rating assigned to each segment.

Future Transportation Improvements

In 2000, the Chattanooga Urban Area published the TransPlan 2025. It outlined the major traffic improvements projected for the study area over the next twenty-five years. The figure 2.3 shows the location and types of proposed improvements. The improvements fall into the following categories:

- Major Construction Projects
- Signalization/Intersection Improvements
- Resurfacing
- Enhancements
- Alternate Transportation
- GDOT/TDOT Projects
- Future Projects (Not Funded)

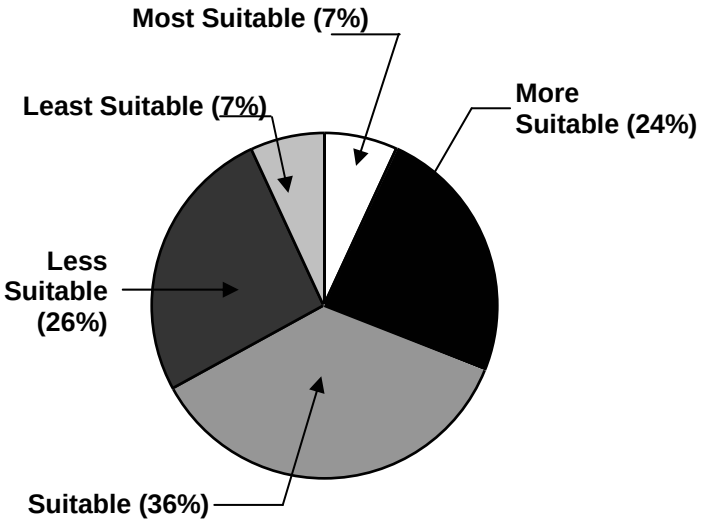


Figure 2.1
Suitability Assessment

Major Construction Projects are significant changes in the roadway cross section. Improvements typically involves widening lanes or adding additional lanes.

Signalization/Intersection Improvements are made to intersections along an identified road segment. These projects may include adding turn lanes, improving turning radii, alignment of intersections and/or adding signalization.

Resurfacing involves milling and repaving existing roads.

Enhancement projects involve improvements to the sidewalk and streetscape. Traffic calming measures are also included within this type of project.

Alternate Transportation projects include greenways, bike facilities, and CARTA-related facilities.

GDOT/TDOT projects are those which are to be funded by the Tennessee Department of Transportation. These projects typically involve widening lanes or adding additional lanes.

There are additional *Future Projects* that had not received funding at the time the plan was created. These include major new roads and bridges.

These future improvements offer a great opportunity to provide bicycle facilities on new, upgraded and repaved facilities.

Mass Transit Facilities

An extensive network of bus routes provides services for the majority of the Chattanooga Urban Area. Bus service is provided within Hamilton County be Hamilton County Rural. The figure 2.4 illustrates the service area of the existing CARTA bus system and the location of CARTA park and ride areas.

Peer Cities Review

A review of bicycle planning and facilities in other selected cities provides a useful context for Chattanooga's own initiatives and aspirations. Chattanooga's record of high quality urban design, progressive transportation planning and green industry prompted the selection of peer review cities that have remarkable records of their own with regard to bicycle planning. Selected cities are innovators in the field, and have not only implemented but, in some cases, initiated best practices in bike planning. Cities are located in the Southeast and throughout the United States.

It becomes clear in cities reviewed that there are some characteristics common to high-quality bicycle programs nationwide. Common characteristics included:

- Having a bike plan
- Having established design standards
- Hiring a bicycle/pedestrian coordinator
- Providing bike racks on all buses
- Providing maintenance programs
- Providing education programs

All of the peer cities reviewed had or were developing a bicycle plan. The plans provide direction and focus for planning efforts. In addition, they provide a means of communicating the vision of the community to decision-makers. Typically, without a plan, bicycling planning efforts result in ad hoc decisions that only provide single independent facilities rather than a comprehensive network.

Design standards were established within each city reviewed. The cities either used standards published by the Association of State Highway and Transportation Officials (AASHTO), their state or locally developed standards. Design standards assure that all bicycle facilities will be built in a consistent manner.

All cities reviewed have some form of a bicycle coordinator position. This position often coordinated pedestrian issues as well. This position is important because it facilitates the delivery of information, coordination of programs, and review of development policies.

Nearly all cities reviewed had bike racks on all buses. This provision greatly expands a cyclist's travel options.

In order to enhance the safety of the cyclist using the cities' facilities, many of them have instituted bicycle facility maintenance programs. Often these involve spot maintenance crews that respond to cyclists who submit spot maintenance forms. Many cities also assured that street sweeping was conducted on streets with bicycle facilities.

Education programs varied from place to place. Most provided educational materials and conducted bicycle workshops. Often, city staff work closely with bicycle clubs to provide education and encouragement programs. Other ideas included:

- Bike mentoring programs
- Advertisement
- Bicycle Rodeos
- Bike to Work Programs
- Safety courses

Insight into successful, city-specific bicycle programs, design guidelines and other details can be useful in evaluating the most appropriate strategies for Chattanooga. Table 2.1 summarizes the characteristics of each city. Appendix C provides a detailed review of each city.

Table 2.1
PEER REVIEW SUMMARY

	Bike Plan	Design Standards	Bike on Buses	Bike/Ped Coordinator	Education Program	Maintenance Program	Mileage
Asheville, NC (Pop.61,000)	**Yes**	**NCDOT Standards**	**Yes**	**Yes, partial**	**Yes**	**Yes, Limited**	**5 mi. bike lanes; 60+ mi. shared; 10 mi. trails**
Austin, TX (Pop. 506,00)	**Yes, Since 1996**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**100 mi. on-street; 32 miles trails**
Denver, CO (Pop.467,000)	**Yes, Since 1999**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**100+ mi. on-street; 130 miles trails**
Gainesville, FL (Pop.130,000)	**Yes, Since 2001**	**FDOT Standards**	**Yes**	**Yes**	**Yes**	**Limited**	**Shared lanes on most roads; 40 mi. trails**
Madison, WI (Pop.191,000)	**Yes, Since 1991**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**49 mi. bike lanes; 50+ mi. shared; 25 mi. trails**
Raleigh, NC (Pop.207,000)	**Yes, Since 1991**	**NCDOT Standards**	**Yes**	**Yes, partial**	**Limited**	**Limited**	**Shared lanes on many roads; 3 mi. bike lanes; 40 mi. trails**
Seattle,WA (Pop.516,000)	**No, Part of Comp Plan**	**AASHTO**	**Yes**	**Yes**	**Yes**	**Yes**	**90 mi. shared lanes; 14 mi. bike lanes; 28 mi. trails**
Tuscon, AZ (Pop.405,000)	**90% Complete**	**Maybe Included**	**Yes**	**Yes**	**Yes**	**Yes**	**500 mi. on-street; 50 mi. trails**

Figure 2.2

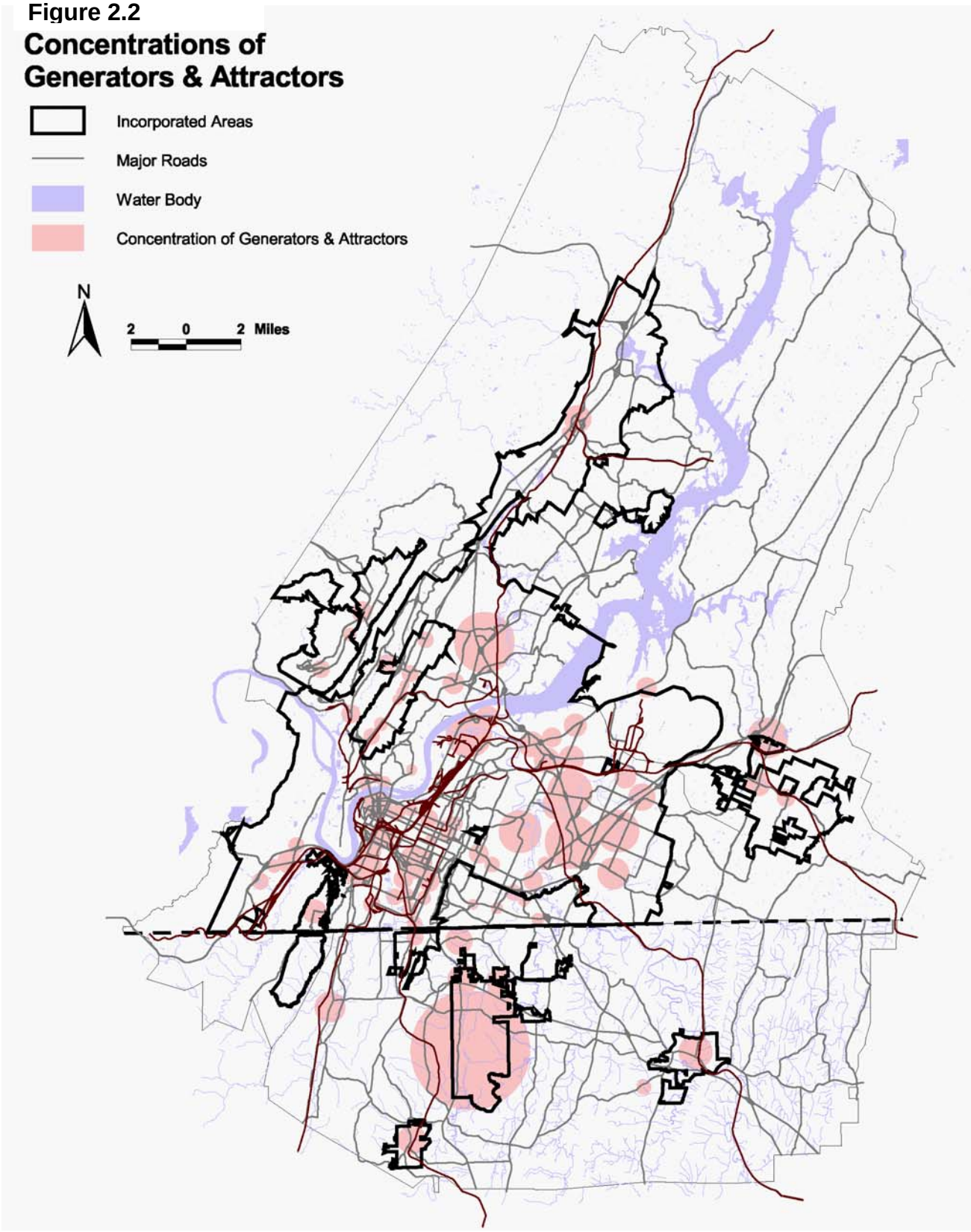

Concentrations of
Generators & Attractors
Incorporated Areas
Major Roads
Water Body
Concentration of Generators & Attractors
N
2 0 2 Miles

Figure 2.3

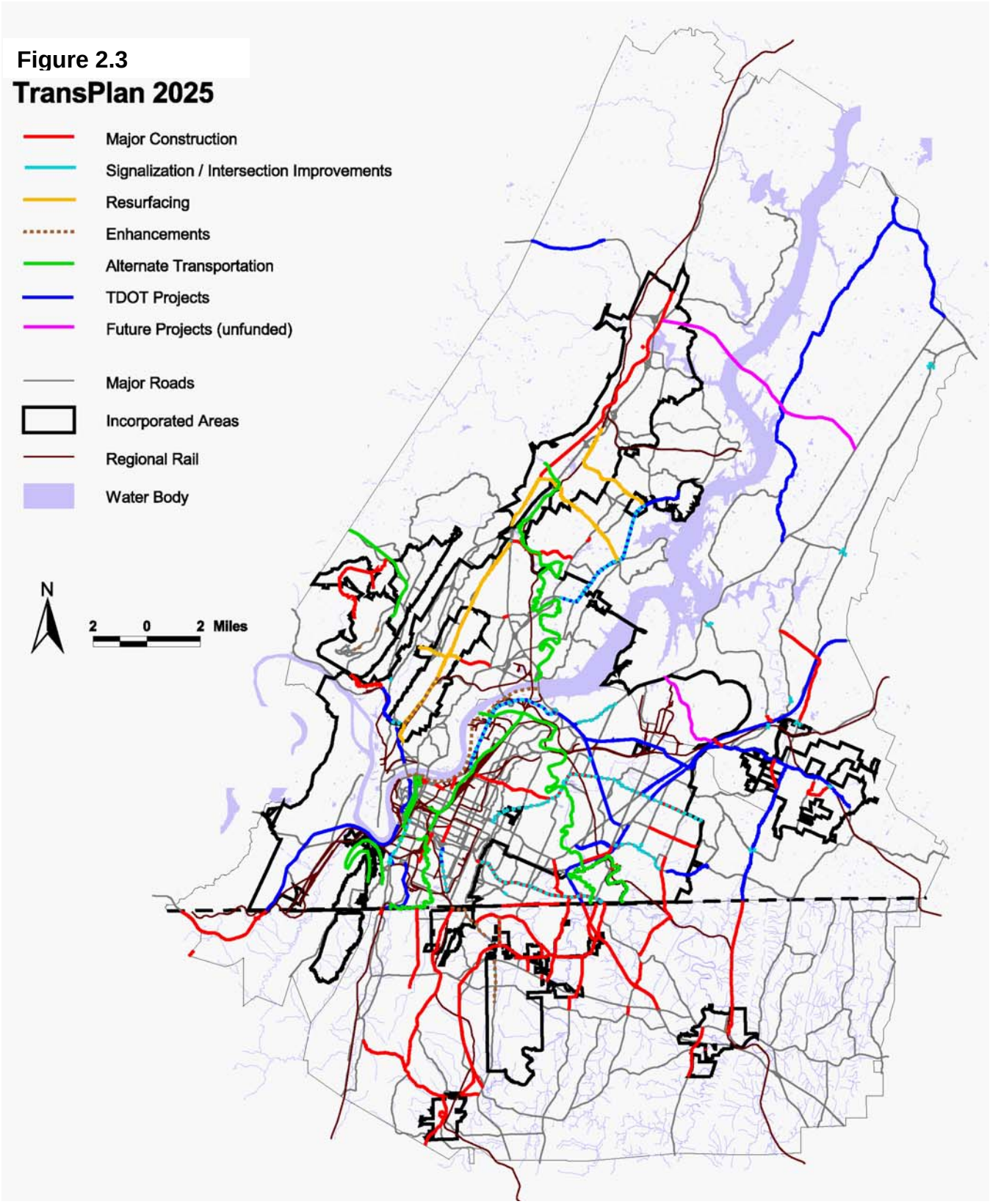

TransPlan 2025
Major Construction
Signalization / Intersection Improvements
Resurfacing
Enhancements
Alternate Transportation
TDOT Projects
Future Projects (unfunded)
Major Roads
Incorporated Areas
Regional Rail
Water Body
N
2 0 2 Miles

Figure 2.4

CARTA Bus Routes & Park & Ride Lots

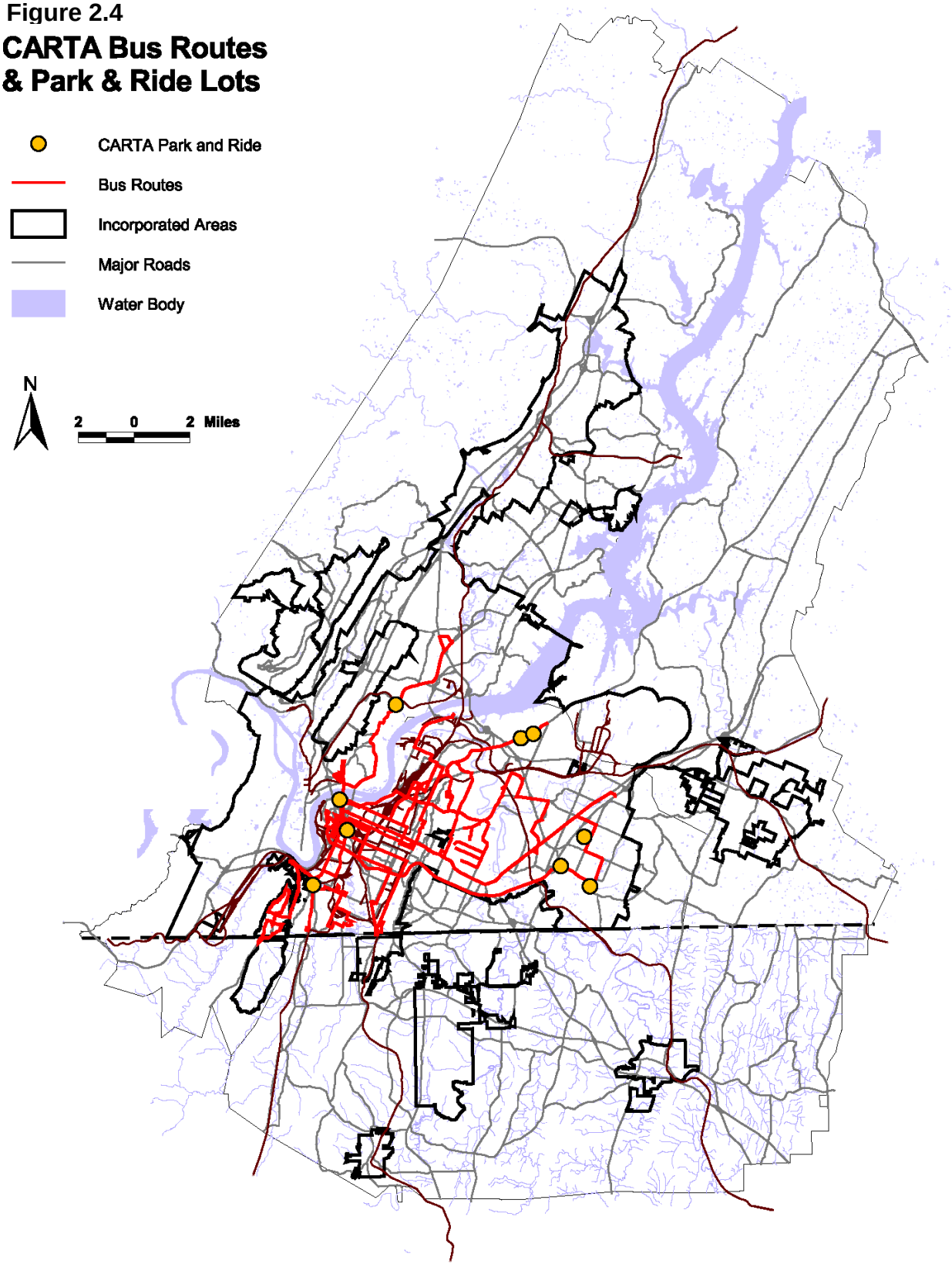


FIGURE 2.5
CENTRAL CITY SUITABILITY

FIGURE 2.6
WEST HAMILTON SUITABILITY

FIGURE 2.7
EAST HAMILTON SUITABILITY

FIGURE 2.8
NORTH GEORGIA SUITABILITY

BICYCLE FACILITY RECOMMENDATIONS

The recommended facility network provides a comprehensive multi-jurisdictional network of facilities that accommodates cyclists of various skill levels.

User Types

The plan provides facilities for all user types and offers options for differing skill levels. User types include the following:

- Class A: Expert
- Class B: Casual
- Class C: Inexperienced.

Class A includes expert or experienced riders. Expert riders generally use their bicycles as transportation and desire direct connections to their destinations with minimal delay. These riders are confident riding their bicycles alongside motor vehicles and are able to negotiate high speed roadways without special bicycle facilities. In designing facilities for expert riders, adequate space should be provided so that cyclists and motorists can pass comfortably without shifting positions.

Class B includes casual or less confident riders. Most of these adult riders prefer to use roadways with fewer motor vehicles and more operating space. These casual riders also use their bicycles for transportation, but wish to avoid heavy, high-speed traffic. They prefer neighborhood streets and multi-use paths separate from roadways. Busier streets should include a designated bike lane or wide shoulder to accommodate casual riders.

Class C includes inexperienced riders, including children. Children are often confident riders with skilled bicycle handling abilities, but they lack the “traffic sense” and experience of maneuvering in high volume motor traffic. For these riders, connections are necessary to destinations including schools, convenience stores and recreational areas. Multi-use paths linking these facilities, in combination with neighborhood bike lanes can accommodate this group.

Facility Types

The following types of bicycle facilities are recommended for use in the Chattanooga Urban Area:

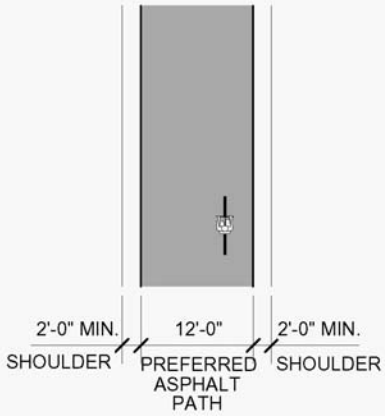
- Class I: Multi-use Paths
- Class II: Bike Lanes
- Class III: Bike Routes
- End Trip Facilities

Design standards for each type of facility are provided in Appendix D.

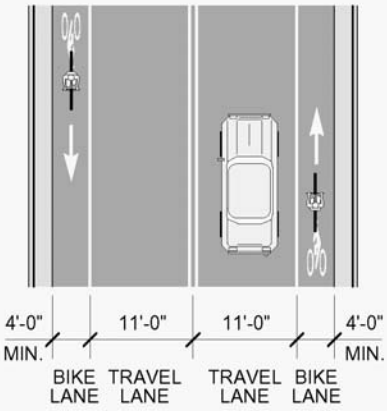
*Class I Facilitie*s include multi-use paths, more popularly known as greenways. Greenways do not allow motor vehicle traffic but they do permit a range of non-motorized travel including bicycling, walking, running and in-line skating. Although typically built in an independent right-of-way, park or easement, greenways may also be located within road rights-of-way, separated from motor vehicle traffic by open space or a structural barrier.

Greenways primarily attract recreational users, but because they typically wind through a community and connect destinations, they also offer an excellent opportunity to function as non-motorized transportation routes. They sometimes offer a more direct route to destinations than the roadway network. For children, or any cyclist uncomfortable with sharing the roads with cars, trails may be the preferred facility. Greenways are an excellent training ground for building the skills to ride on the road.

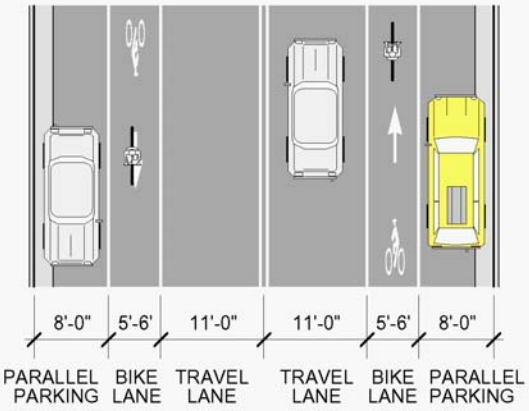
Example of Class I: Multi-use Path



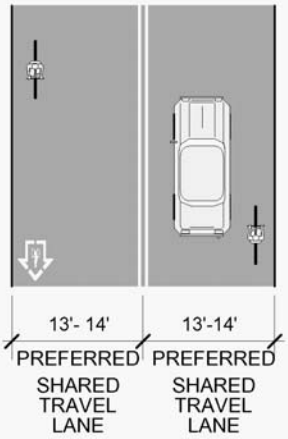
CLASS I: MULTI-USE PATH



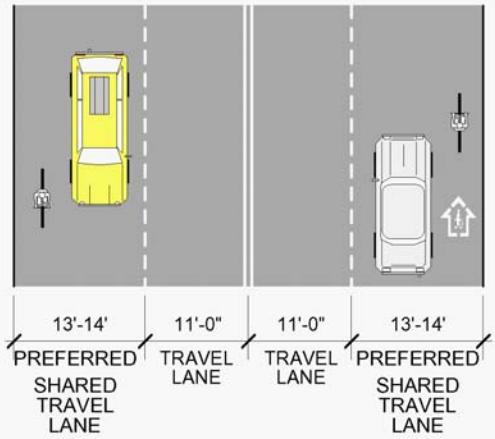
CLASS II: BIKE LANE WITHOUT PARALLEL PARKING



CLASS II: BIKE LANE WITH PARALLEL PARKING



CLASS III: BIKE ROUTE - 2-LANE CROSS SECTION



CLASS III: BIKE ROUTE 4-LANE CROSS SECTION

Class II Facilities include bicycle lanes and shouldered bikeways. A bicycle lane is a portion of the roadway separated from conventional travel lanes with a stripe, and designated for exclusive or preferential use by bicyclists. They are one-way facilities placed on both sides of a street in order to carry bicyclists in the same direction as motor vehicle traffic. Bike lanes also help to increase the total capacity of roadways by segregating users. In addition to lane striping, pavement markings and signage identify bike lanes.

Shouldered bikeways are paved shoulders separated from travel lanes with a lane stripe, and are typical for rural roadways without curbs and gutters. Pavement markings are not typically used on shouldered bikeways, since they can also be used for other functions, such as for vehicle breakdowns.

Class III Facilities include bike routes. On a bike route, bicyclists and motorists share the same travel lanes. Except in cases where wide outside lanes are provided, motorists will typically have to move into the adjacent lane in order to safely pass a bicyclist. Bike routes function well on local and minor collector streets, where traffic volumes and speeds are typically lower than on major collector and arterial streets. There are three types of shared roadways: Wide Outside Lanes (WOLs), Shared Signed Roadways (SSRs) and Local Streets.

On major collector and arterial streets, where severe physical constraints preclude bike lanes, WOLs are a desirable alternative. Because they provide less operating space than bike lanes, and are not designated for exclusive bicycle use, some cyclists will be uncomfortable using WOLs. However, WOLs allow most motor vehicles to pass bicyclists without weaving into the adjacent lane and provide a greater degree of comfort to cyclists than a typical 11' or 12' lane.

SSRs are arterial or collector streets where bicycle traffic or demand is high but bike lanes or wide outside lanes cannot be provided due to severe physical constraints. SSRs are posted with appropriate speed limits and rely on signage to encourage both drivers and cyclists to be alert for all roadway users. Where appropriate, traffic calming devices can be used on collectors to further encourage appropriate travel speeds. In many cases, SSRs are a temporary solution, applied until a design solution that incorporates more appropriate bicycle facilities can be implemented.

Example of Class II: Bike Lanes

Example of Class III: Bike Route

Local streets should be able to safely accommodate bicyclists without any special treatment. Signage may be used to identify a through-bike route that follows a local street.

In cases where local streets carry more traffic at greater speeds than they were designed for, traffic calming techniques such as speed humps and pedestrian bulbs may be implemented to help ensure that bicycle and motor vehicle traffic operate compatibly.

The Bicycle Facility Network

The recommended bicycle facility network illustrated in figures 3.2-3.5 encompasses 377.5 miles. The network is made up of the following facility types:

- 36 miles of Class I: Multi-use paths
- 155 miles of Class II: Bike lanes
- 186 miles of Class III: Bike routes
- 0.5 mile of Special Facility

Appendix E has a complete listing of all recommended segments and associated facility types.

The plan is comprised of major bicycling corridors running all directions. These major routes provide contiguous north-south and east-west routes providing regional connections. Additional facilities provide local connections that reinforce the network. Most of the population in the existing urbanized area is within two miles of a bicycle facility. By utilizing local streets, most everyone can safely access the network of bicycle facilities. Parallel facilities have been provided in order to accommodate various skill levels of users.

An additional 140 miles of the multi-use paths have been planned prior to this plan by The Trust for Public Land and municipalities. Of those 140 miles, 13.5 miles are existing. The 40 miles of multi-use paths recommended within this plan have been recommended primarily for their important connections between on-road bicycle facilities and the previously planned and existing multi-use paths. All planned and existing multi-use paths comprise 35 percent of the recommended facilities.

The multi-use path network provides a countywide system where more inexperienced users can gain confidence using their bicycles. The greenway network can be utilized for non-recreation, but because it typically does not provide the most direct route to desired destinations, it is primarily oriented to recreational cyclists.

Many of the existing greenways are not paved, making it more difficult to traverse by bicycle and more difficult and expensive to maintain. For these reasons, it is recommended that all major greenways, or multi-use paths, be paved.

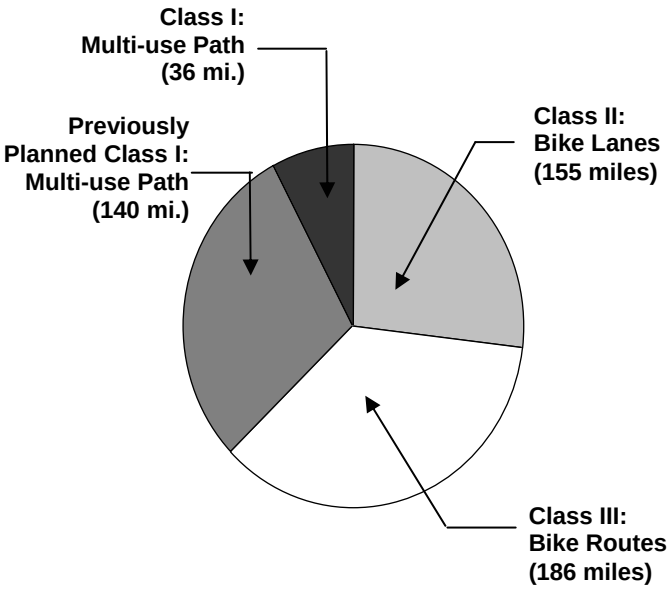


Figure 3.1
Distribution of Recommended Bicycle Facilities

Bike lanes and bike routes constitute 65% of all planned bicycle facilities. The plan identifies 154 miles of bike lanes and 188 miles of bike routes. These facilities provide the most direct routes to desired destinations and are often utilized by more experienced cyclists.

Because many of the roads cannot accommodate bike lanes or bike routes in their existing cross section, many of the roads will require modifications. Modifications may include the following:

- Paving an unpaved shoulder
- Reducing existing travel lane widths
- Reducing the number of conventional travel lanes
- Reducing on-street parking on specific segments
- Widening the roadway

Further description of adding bicycle facilities to existing roads can be found in Section 6 of Appendix D. Specific modifications for each segment are listed in Appendix E.

Of the 154 miles of bike lanes identified, 20 percent, or 31 miles, require little or no modifications to the cross section. Most of these require only signage, striping and pavement markings. The remaining eighty percent require significant modifications. Of the total 154 miles, sixty-two percent of the bike lanes are planned on future roadway projects identified in the area's transportation plan.

Of the 188 miles of bike routes, 89 percent require little or no modification to the cross section. Most of these require signage and pavement markings or restriping. The remaining 11 percent are either identified as future roadway projects included in the area's transportation plan or on roads that may be upgraded in the future.

End of Trip Facilities

Cyclists are often discouraged from using their bicycles as transportation because they have no place to park their bicycle at their destination or because they have nowhere to shower and change clothes if necessary. End of trip facilities are provisions which are intended to increase convenience and safety for the user. Types of end of trip facilities include bicycle parking and shower and changing facilities.

Bicycle parking can be addressed by the provision of bike racks or bike lockers. Bike racks come in a range of shapes, sizes, materials and colors. Bike racks are intended to provide a short-term parking solution. While bicycles are intended to be locked to the rack, the possibility of theft or vandalism still exists. Bicycles often have to be partially dismantled (wheels, pump, light, etc.) and each part locked separately or taken with the rider in order to be completely secured when locked to a rack. Additionally, bicycles stored at outdoor racks are exposed to damage from inclement weather conditions.

Another type of bicycle storage is the bike locker. Bike lockers are containers designed to store bicycles without dismantling. A rider can also store gear in the locker. The bicycle is completely enclosed and secure from impact. These types of facilities are

Bicycle Loop Rack

recommended where parking is for much longer periods. These types of facilities could be included at CARTA park and ride facilities for those who do not want to ride the bus with their bike.

Showers and changing facilities are especially important for riders commuting to work. Many commuters are discouraged from using their bicycles to travel to work due to lack of these facilities. Many bicycle-friendly cities have included shower facilities into their commercial development codes. The codes are often based on location, square footages and/or number of employees.

End of Trip Facilities Recommendations

Bicycle parking is a critical component of the plan because it assures that cyclists will have a place to secure their bikes once they have reached a destination. It is recommended that bicycle parking initially be provided at public facilities and CARTA bus shelters. Over time, each municipality should develop bicycle parking requirements as a part of their development codes.

Appendix D provides clear guidelines for providing bicycle parking. The guidelines recommend that a loop rack system be implemented in most places. Where space is at a premium, as on downtown streets, it is recommended that the "Pi" rack be used.

In an effort to expand the mobility of cyclists, it is recommended that bike racks be installed on the

entire CARTA transit bus fleet (currently 66 buses). It is important that racks be included on all buses because cyclists must have confidence that a rack will be available should they decide to use the bus system. Bike racks expand the distance cyclists can cover while maintaining independence once reaching their destination and give cyclists the option of riding a bus home when weather becomes inclement. It is further recommended that bike racks be included on all Hamilton County Rural Transportation bus fleet as well (currently 12 buses).

Providing shower facilities for cyclists can make cycling a more convenient option for those who choose to ride to work. It is recommended that shower facilities be provided for city staff in key locations. It is further recommended that arrangements with fitness centers near concentrations of major employers be explored. These arrangements could involve the use of locker and showers facilities at a reduced cost. Many cities have enacted shower requirements within their development codes. Over time as political support for bicycle facilities strengthens, this provision should be seriously considered.

Design guidelines for end of trip facilities are provided in Appendix D.

FIGURE 3.2
CENTRAL CITY MAP

FIGURE 3.3
WEST HAMILTON MAP

FIGURE 3.4
EAST HAMILTON MAP

FIGURE 3.5
NORTH GEORGIA MAP

IMPLEMENTATION

Strategies for Increasing Bicycle Use

The purpose of this plan is to increase the percentage of transportation trips undertaken by bicycle while increasing safety and comfort of bicycling in the Chattanooga region. The four elements of successful bicycle programs are engineering, education, encouragement, and enforcement. These are often referred to as the "Four Es".

The bulk of this plan addresses engineering: the provision of well designed, connected, safe and practical bicycle facilities. Related planning and engineering issues include land use, street network planning, access management, and roadway design standards. Education, encouragement, and enforcement involve a range of promotions, incentives, programs, and other initiatives, in order to maximize the benefits of the new bikeway facilities.

This section of the plan provides detailed recommendations related to all of the "Four Es" of a bicycle program. The major steps are:

- Provide safe, convenient bicycle facilities
- Institutionalize bicycling within all aspects of the community
- Make bicycling an attractive option
- Develop bicycle-friendly atmosphere by ensuring that growth occurs in a manner that is conducive to cycling
- Maintain bicycle facilities built
- Monitor progress
- Assure funding for facilities and programs

<u>Provide Safe, Convenient Bicycle Facilities.</u> Bicycling facilities include both on-road, off-road and end-of-trip facilities. As pointed out in BAC and public meetings, most people view the lack of these facilities as major barriers to bicycling.

The purpose of this plan is to increase the percentage of transportation trips undertaken by bicycle while increasing safety and comfort of bicycling in the Chattanooga region.

On-road bicycling facilities affirm the rights of cyclists to be on the road and alert drivers that cyclists may be present. Multi-use paths provide a place for people to improve their bicycling skills while providing a recreational venue for cyclists, skaters and pedestrians.

Bicycle parking facilities, such as racks and lockers, provide convenient places to secure bicycles near destinations. When buses are equipped with bike racks, both modes become more attractive options and mobility is enhanced.

Example of bike lanes with parallel parking

The following actions are recommended for providing bicycle facilities in the study area:

- All municipalities adopt the bicycle facilities master plan recommendations as a part of their long range transportation plan
- Design and construct each of the bicycle facilities identified in the plan in accordance with the prioritization plan
- Provide bicycle parking at all public facilities
- Provide bike racks on the entire CARTA bus fleet
- Provide bike racks at all CARTA park-and-ride lots and downtown bus shelters
- Pave all existing unpaved greenway segments
- Continue to design and construct the planned greenway system proposed by the Trust for Public Land and other local municipalities
- Review all new road projects not shown in the Bicycle Facilities Master Plan to determine their appropriateness for bicycle facilities
- All municipalities enact bicycle parking requirements within their development guidelines

Institutionalize Bicycling. Many land use, development, and transportation decisions have, or can have, bicycle impacts. Bicycle considerations should be integrated into review processes for all such endeavors. Planning departments should evaluate the proposed site design of new projects. All travel modes, including bicycling, walking and driving should be integrated into transportation department projects. When developers design new projects, they must understand that bicycling is an important consideration to the approval process.

It is recommended that the Regional Planning Agency create a bicycle coordinator position. The responsibilities would include the coordination of bicycle facility implementation with various government agencies and departments within the planning area. The coordinator would also be responsible for providing bicycling input on future projects, and coordinating and conducting promotional and educational initiatives. The position could combine bicycle and pedestrian planning responsibilities.

The following additional actions are recommended for institutionalizing bicycling:

- Provide copies of the plan to all departments within the City and County
- Conduct quarterly training sessions with City and County staff that share the vision and its importance to the community
- Conduct annual bicycle design seminars with key departments that teach best practices and update participants on the progress of the plan
- Provide copies of the Plan to the GDOT and TDOT
- Review all TDOT and GDOT plans to ensure the inclusion of bicycle and pedestrian facilities that are in compliance with the adopted bicycle and pedestrian plan
- Review all plan submittals, both residential and commercial, for compliance with the adopted bicycle and pedestrian plan
- Review all new road projects not shown in the Bicycle Facilities Master Plan to determine their appropriateness for bicycle facilities
- Conduct quarterly training sessions with various police departments that share the vision and its importance to the community
- Establish police bicycling patrols within more urbanized areas
- Provide a bicycle pool, with bikes and helmets at offices for governmental staff to make short trips

- Offer flexible work hours for cyclists in government positions
- Encourage municipal staff to cycle to work
- Offer incentives to those who choose to cycle to work

Make Bicycling Attractive. For people to change their transportation habits, they first need to understand why it is important to the future of the community. Second, they must be convinced that bicycling for non-recreational trips is a viable option for them.

A comprehensive strategy should address potential adult cyclists, youth, and drivers of automobiles. It should include mass media communication, presentations, events and demonstrations.

The bicycle coordinator and the bicycle task force would be responsible for coordinating and developing cycling programs with the various private and public entities.

Adult Programs. Advocacy programs for adults should be focused. Programs should target small geographic areas that are conducive to cycling, like neighborhoods and specific demographic groups that have the greatest potential for using a bicycle. Characteristics of areas conducive to cycling include:

- Within two-miles of large concentrations of generators and attractors
- Highly mixed land uses
- Connected to bicycle facilities
- Few topographic constraints within a two-mile radius of users
- Major employers with shower and locker facilities
- Public Facilities
- Major employers around fitness centers
- Areas with high bus ridership

General characteristics of people that are more likely to accept bicycling would include

- Do not own an automobile
- Ride the bus regularly
- Between the ages of 18 and 35
- Live in areas that are conducive to cycling
- Fitness is important
- More environmentally conscious

It is important that those who are in direct communication with the target audience be of similar characteristics as the audience. Furthermore, if possible, programs should be delivered by the leaders within a specific social group. (e.g. leaders of church, union leaders, youth talking to youth, neighborhood leaders)

Programs should address the following:

- Benefits of bicycling both individually and collectively
- Misconceptions about bicycling and its viability as a transportation option for many of trips
- Proper equipment
- Safety & rules of the road
- Routes to desirable destinations in neighborhoods and travel time for each route at various times of the day

Programs should also be oriented to various user types. User types include those using bicycling for domestic trips, commuters and/or recreational users.

Youth Programs. Many of the existing advocacy programs are oriented toward younger children. These programs should continue. The youth today will be tomorrow's drivers, so it is important for them to understand that bicycling is another transportation option and bicycle users have the right to share the roads with vehicles.

Programs specifically targeted to older children and teens should also be included in the overall strategy.

Programs for youth should stress the following:

- Wearing helmets
- Safety
- Responsibilities of owning a bicycle
- Bicycles are not toys
- Bicycles are real vehicles like cars and offer independence
- Benefits of bicycling
- Rules of the road
- Riding skills

Drivers. To improve safety and reduce confusion on the road it is important for drivers to understand that cyclists have the right to be on the road, and how bicyclists operate. This knowledge will allow both drivers and cyclists to operate in a more predictable manner.

A mass media advertising campaign should be used to address driver awareness. The campaign should use every means available. Examples include:

- Advertisement of message via newspaper, local magazines and outdoor advertising on billboards and CARTA buses
- Mailings with electric bills
- Information available at the Department of Motor Vehicles
- Radio and television interviews
- Published articles in local newspapers
- Published articles in magazines oriented to non-cyclists
- Television stories on the local news

The mass media campaign message should at the same time encourage drivers to consider bicycling for some of their trips.

The following actions are recommended to make bicycling an attractive option for drivers:

- Initiate mass media campaign
- Use the internet to provide a clearinghouse for information about bicycling in Chattanooga
- Create bicycle maps indicating easiest and more difficult routes for the public
- Make maps available at bike shops, public offices and via the internet
- Include end facility locations on website (include private development)
- Work with University of Tennessee-Chattanooga Communications Department to develop class project for bicycle promotion campaign
- Maintain the existing Bicycle Task Force
- Design and construct recommended bicycle facilities
- Develop and deliver specific programs for various potential adult cyclists frequently
- Develop and deliver programs for children and teens frequently
- Continue annual bicycle rodeo event
- Continue “Bike It and Like It” program”
- Establish bicycle mentoring program that teams experienced riders with new riders and/or designate specific “meet and ride” lots where commuting cyclists can meet and ride together on a daily basis
- Hold Saturday Trial Bike-to-Work events once a month that give people a chance to try bicycling to their place of work
- Teach by example by organizing a presence of cyclists on the road during peak traffic time

- Hold bicycle fashion events
- Establish an annual alternative transportation exposition

Develop Bicycle-Friendly Atmosphere. An area's land use pattern and density have proven to have a significant influence on a person's decision to bicycle for non-recreational travel. In general, development patterns over the last fifty years have discouraged bicycling because they have resulted in segregated uses with long distances between destinations.

The following actions are recommended to ensure that future land developments patterns are conducive to cycling:

- Encourage and promote the development of a highly connected street network
- Encourage and promote a greater mix of uses and higher densities
- Upgrade to bicycle-safe grates on all roadways when roads are repaved

Maintain Bicycle Facilities. The conditions of bicycle facilities also influence a person's decision to bicycle. If bike lanes and shoulders are littered with debris, bicyclists will choose to ride in conventional travel lanes, or not ride at all. Gravel, broken glass, and other debris easily cause flat tires, and can create crashing hazards. Greenways and roads with degraded pavement surfaces are also a deterrent. Once bicycle facilities have been built it is important to maintain them.

The following actions are recommended to maintain the bicycle network:

- Establish a spot maintenance program for bicycles
- Develop a plan of action for executing spot maintenance requests
- Assign responsibility of maintenance of on-road bicycle facilities to Public Works Department or related departments within each community
- Assign responsibilities of maintenance of multi-use paths to Parks and Recreation Departments or related departments within each community
- Make spot maintenance forms available on request, at bicycle shops and on the recommended website
- Make roads with bicycle facilities a priority on street sweeping schedules

Monitor Progress. The community needs to evaluate the progress of the bicycle plan in order to assure planning, design and advocacy efforts are appropriate and effective. Monitoring further provides a basis to evaluate future changes. Data collection should begin immediately after the plan is adopted. This will establish a benchmark to compare with future data.

The following actions are recommended to monitor the progress of the bicycle plan:

- Work with bike clubs and bicycle task force members to establish a bicycle data collection program to conduct bicycle counts and conduct user and public attitude surveys bi-annually to evaluate the effectiveness of achieving the goals of the plan
- Work with University of Tennessee-Chattanooga classes to develop and interpret surveys
- Provide progress reports to community decision makers (i.e. city council, county commission, mayors, planning commissions, Departments of Transportation)

Assure Funding. The majority of these recommendations require funding. Without adequate financial resources, a bicycle infrastructure cannot be developed nor can programs be maintained. Each community should aggressively pursue funding opportunities from public and private sources.

The following actions are recommended to maintain the bicycle network:

- All municipalities commit annual funding for implementation of the bicycle plan
- Actively pursue federal and state transportation and enhancement funds
- Search for and apply for applicable non-profit grants to fund segments of the bike facilities
- Require developers to include bicycle facilities within new developments
- Pursue sponsorship for bicycle routes (i.e. bike companies, private businesses, major employers)
- Recruit volunteers within the community and establish an effective volunteer network

Prioritization

The bicycle facility projects have been broken into three priority phases. Each priority phase is associated with a specific time frame. Priority one projects are intended to be built within the first three years. Priority two projects are within a 3- to 10-year timeframe and Priority three projects are within a 10- to 20-year time frame. All projects are identified in figures 4.2-4.5. The project listing in Appendix E identifies each projects priority.

The 140 miles of previously planned multi-use paths have been prioritized prior to this plan through The Trust For Public Land and other municipalities. These segments are not included within prioritization of this plan. It is recommended that the plans for these facilities continue to be implemented.

The following describes actions within each priority phase. The success of bicycle initiatives will not be judged on the miles of facilities constructed, but on the number of cyclists using the facilities. Targets for ridership are identified within each description.

It is important to remember that many of these facilities are dependent on future roadway improvements. Because the cost of bicycle facilities are relatively minor when combined with roadway projects, those segments that coincide with future projects should be built when those projects are constructed regardless of their priority.

Priority One Projects. Sixty-two miles of bicycle facilities have been identified as Priority one projects. They account for 16 percent of the total recommended projects. Priority One projects by type are identified in the following:

- Class I Facilities: 0 miles
- Class II Facilities: 24 miles
- Class III Facilities: 38 miles

Most projects are pilot projects that can be relatively easily implemented. Their purpose is to provide a cohesive bicycle network in areas with high cycling potential.

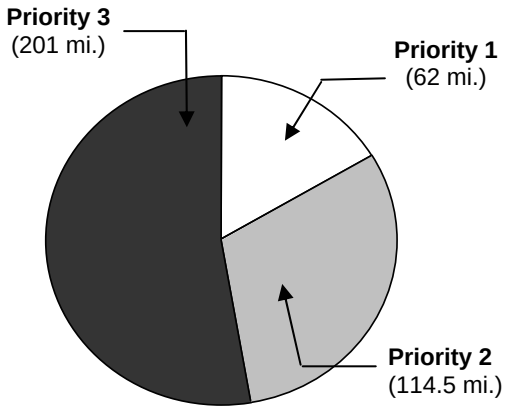


Figure 4.1
Distribution of Bicycle Facilities by Priority

By concentrating bicycle facilities, each municipality can focus its advocacy programs within the pilot project areas. These areas will enable each municipality to build political support for bicycle facilities as ridership increases. The hope is that these projects can be pointed to as successful examples and lay the groundwork for future projects.

Priority One projects within the City of Chattanooga create a loop that connects Downtown Chattanooga and its surrounding neighborhoods, including the St. Elmo Area. It further capitalizes on the Walnut Street Bridge by providing a loop within the North Shore neighborhoods and Moccasin Bend.

A segment of Main Street that provides a critical connection over Missionary Ridge and to East Ridge is also included within Priority One projects.

The City of Red Bank includes a segment of Dayton Boulevard that connects to the North Shore neighborhood routes and Signal Mountain Road.

Projects for Signal Mountain include a central spine that connects many of its neighborhoods.

A portion of Highway 27 connecting Chattanooga, Ft. Oglethorpe, and the Chattanooga and Chickamauga Military Park is also included in Priority One projects.

In Collegedale, a connection between the major commercial areas, City Hall and Southern Adventist University is recommended to be included in Priority One.

Ringgold Road, Seminole Road and Tombrass Road are included in East Ridge Priority One projects. These facilities provide connections between major commercial areas, neighborhoods, Chattanooga and East Ridge City Hall.

In addition to constructing the Priority One projects, it is recommended that the following actions be taken:

- Install bike racks on entire CARTA transit bus fleet (66 buses)
- Install bike racks on entire Hamilton County Rural Transportation bus fleet (12 buses)
- Install bike racks at all public buildings and CARTA bus/shuttle shelters in downtown Chattanooga
- Create and fill bicycle coordinator position at RPA or Public Works
- Begin public awareness campaign
- Establish a bike pool with bikes and helmets for staff at Development Resource Center
- Provide showers at major places of employment
- Begin maintenance initiatives
- Establish a web site for mapping and monitoring
- Establish baseline for future monitoring

Within the three-year period, the targeted ridership levels should double existing ridership levels as established by the baseline monitoring program.

Priority Two Projects. Priority Two projects include 114.5 miles, or 30 percent These projects build upon the previously built facilities. Priority Two projects by type are identified in the following:

- Class I Facilities: 13 miles
- Class II Facilities: 50 miles
- Class III Facilities: 51 miles
- Special Facility (bike racks on Incline Railway): 0.5 mile

In the City of Chattanooga, Priority Two projects expand into the Brainerd and Hamilton Place neighborhoods. The combination of Bonny Oaks Drive, Glass Street, Roanoke and Orchard Knob provide important northern bicycle corridors. These additional networks not only provide local connection, but further expand the network by providing additional connections to downtown Chattanooga.

It is recommended that two lanes on Cummins Highway be converted into bike lanes in order to provide connection around Lookout Mountain. The Incline Railway offers an opportunity for cyclists to quickly move between Lookout Mountain and Downtown Chattanooga. In order to facilitate this connection it is recommended that bike racks be installed on the Incline Railway.

Further expansion along Dayton Boulevard from Red Bank's improvements in Priority One to the City of Soddy Daisy is recommended. Morrison Springs Road, Ashland Terrace and Access Road provide an important connection to the North Chickamauga Greenway.

Expansion of the Signal Mountain improvements in Priority One is recommended in order to create a loop that increases the connectivity between neighborhoods and the desirable destinations along Ridgeway Avenue.

In the Ooltewah-Collegedale area, the expansion of the Wolftever Creek Greenway system is recommended. This greenway corridor offers an excellent opportunity to connect the numerous residential developments along the corridor to the commercial centers of Ooltewah and Collegedale. Apison Pike and Old Lee Highway provide connection to the east-west corridor that ultimately leads to Downtown Chattanooga. A greenway has been recommended along the eastern border of the VAAP site that connects to Ooltewah via Hilltop Drive/Lee Highway. Additional facilities include

Mountain View Road and Ooltewah-Georgetown Road.

In addition to constructing the Priority Two projects it is recommended that the following actions be taken:

- All municipalities should install bike racks at all public buildings, starting first at buildings along bicycle facilities
- Establish an annual Alternative Transportation Exposition
- Continue advocacy efforts
- Continue maintenance programs
- Continue monitoring programs

Within the seven-year period, the targeted ridership level for the planning areas should double from levels at the end of the Priority One phase. The minimum target level should be 1 percent of all vehicle trips.

Priority Three Projects. Two hundred and one miles, or 53 percent, of the bicycle facility recommendations have been included in the Priority Three projects. These projects complete the network. Priority Three projects by type are identified in the following:

- Class I Facilities: 23 miles
- Class II Facilities: 81 miles
- Class III Facilities: 97 miles

The Priority Three projects complete the bicycle facility recommendations.

Wilcox Boulevard and East Brainerd Road provide critical east-west corridors that complete many of the local newtorks. The combination of Jenkins Road and Graysville Road provides an important north-south connection between Hamilton Place and North Georgia.

Bicycle facilities are provided in the Hixson area via Norcross Road, Gadd Road, Hixson Pike, and Cloverdale Road.

In the central portion of the West Hamilton County planning area, a network is created using Boy Scout Road, Eagle Road, Thrasher Pike, Hixson Pike, Dallas Hollow Road, Sequoyah Access Road, and Daisy Dallas Road. Bicycle facilities are recommended on these roads as they are upgraded.

Regional connections are provided by Taft Highway, the extension of Dayton Boulevard to the north, Highway 58, Ooltewah-Georgetown Road, and Highway 193 to the south.

Since many of the bicycle facilities in North Georgia cannot be accommodated on existing road cross sections, they are included in Priority Three as they are upgraded.

Important connections between North Georgia and the Hamilton County line are provided via Highway 153, Graysville Road, Highway 41, Mack Smith Road, McFarland Avenue, and Wilson Road. Additionally, greenways connect East Ridge and North Geogia.

Connections to Chickamauga are provided by Mission Ridge Road and Chickamauga Road. State Route 2 to the east of Ft. Oglethorpe provides connection to Ringgold. Highway 153 is used connect the Ooltewah-Collegedale area with Ringgold when it is upgraded.

In addition to constructing the Priority Three projects it is recommended that the following actions be taken:

- All municipalities should include bicycle parking requirements within their development codes
- All municipalities should include shower facility requirements within their development codes
- Continue advocacy efforts
- Continue maintenance programs
- Continue monitoring programs

Within the ten-year period, the targeted ridership level for the planning areas should increase to 5 percent of all vehicle trips.

FIGURE 4.2
CENTRAL CITY PRIORITY

FIGURE 4.3
WEST HAMILTON PRIORITY

FIGURE 4.4
EAST HAMILTON PRIORITY

FIGURE 4.5
NORTH GEORGIA PRIORITY

Opinion of Probable Cost

The total cost for implementing the entire proposed bicycle recommendations is **$24,586,677.00.** As described in the previous section, the project has been divided into three priority phases that span twenty years.

The following is a breakdown of cost for each priority phase and each facility type within each phase.

Priority One (0-3 years)

Class I: Multi-Use Paths $0
Class II: Bike Lanes $575,700.00
Class III: Bike Routes $263,700.00
Bike Racks on CARTA Buses $66,000.00
Bike Racks on Rural Buses..... $12,000.00
234 Bike Racks..... $70,000.00
Bicycle Coordinator Position.. $150,000.00
Advocacy Programs $200,000.00
Showers @ DRC $12,500.00
Bike Pool.....Donated
Total $1,349,900.00

Priority Two (4-10 years)

Class I: Multi-Use Paths $6,575,000.00
Class II: Bike Lanes $1,103,400.00
Class III: Bike Routes $351,500.00
300 Bike Racks..... $90,000.00
Bike Racks on Incline Railway... $1,000.00
Bicycle Coordinator Position.. $350,000.00
Advocacy Programs $175,000.00
Total $8,645,900.00

Priority Three (11-20 years)

Class I: Multi-Use Paths .. $11,312,177.00
Class II: Bike Lanes $1,816,200.00
Class III: Bike Routes $622,500.00
300 Misc Bike Racks $90,000.11
Bicycle Coordinator Position.. $500,000.00
Advocacy Programs $250,000.00
Total $14,590,877.00

The cost has been estimated using 2002 dollars and does not account for inflation. Costs reflect only the cost of items specific to bicycle facilities, such as pavement markings, striping and signage.

Typically, road improvements are not initiated solely for the construction of bicycle facilities but rather incorporated into routine repaving, widening or new construction. These costs assume that the bicycle facilities that require repaving or widening will be constructed when the vehicular transportation project is initiated. In many instances bicycle facilities have been included on roadways identified in the TransPlan 25 for that reason. Roads are routinely repaved every ten years. This provides an excellent opportunity to include bicycle facilities.

This does not preclude the idea that roadways can be repaved, restriped or widened solely for the addition of bicycle facilities. It should be noted that the costs shown include costs related specifically to the provision of bicycle facilities. If a community chooses to repave or widen the street for bicycle facilities, vehicular traffic on the improved roadway also benefits.

The costs do not factor in pavement removal, paving, and non-bicycle related striping and lane markings that may be necessary prior to installing the bicycle facility.

Multi-Use Paths. Whereas the street-based bicycle facilities recommended in this plan primarily involve the installation of the items described above onto existing roadways, the construction of a multi-use path is similar in cost to construction of a new road. The construction of multi-use paths is estimated at $500,000.00 per mile, excluding land acquisition cost. The construction involves grading, paving, site furniture, parking areas, signage and trailheads.

Bike Lanes. All of the recommended bike lanes include signage, striping, and pavement markings. The replacement of non-bicycle friendly grates was also included as necessary. On most multi-lane streets, we would recommend restriping for bike lanes including a pavement overlay; pavement overlays on streets with curbs and gutters also require pavement removal. The construction of bike lanes is estimated at $21,875.00 per mile.

Bike Routes. All of the recommended bike routes include signage and pavement markings. For a few bike routes, the relocation of existing lane striping is necessary in order to maximize the width of the shared outside travel lane. The replacement of non-bicycle friendly grates was also included .as necessary. In general however, wholesale restriping on bike routes has been recommended only when the additional width to be gained is more than one foot in each direction. The construction of bike routes is estimated at $10,000.00 per mile.

Bike Racks on Buses. These racks would be installed CARTA's current 66 transit bus fleet. Racks are also recommended for Hamilton County Rural Transportation's 12 buses. The unit cost used for each rack was $1,000.00.

Bike Racks. Priority One involves the inclusion of two bike racks at all CARTA bus shelters and shuttle stops in Downtown Chattanooga Area. An additional 100 have been estimated for various public facilities, concentrated in downtown. Other priorities assume an additional 300 bike racks for public facilities located adjacent to the respective phase of bike facilities. The location for these racks would be determined on annual basis. The unit cost used for each rack is $300.

Bicycle Coordinator Position. The recommended bicycle coordinator position within the RPA is estimated to cost $50,000 annually.

Advocacy Programs. A budget of $100,000 dollars was assigned to the first year of the advocacy initiatives described previously in this section. The following two years the budget would be reduced to $50,000. After the first three years, it is envisioned that the budget for programs could be reduced to $25,000.

Funding Sources

This plan is a major step in establishing the Chattanooga Urban Area as a bicycle-friendly community. Bringing the vision to life will require funding. Fortunately there are many funding sources available. The following provides a description of various Federal, State, and Local funding opportunities.

Federal Funding

Transportation Funding. In 1991, Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA), a six-year bill authorizing a wide range of federal-aid transportation programs, including programs that fund trail acquisition and development. In June of 1998, the Transportation Equity Act for the Twenty-first Century (TEA-21) was enacted and authorized through 2003 and expands on those programs that have proven to be a boon to the implementation of bicycle-related facilities.

The following is a summary of the funding sources available through TEA-21:

- *National Highway System* funds can be used for bicycle projects adjacent to any highway on the National Highway System, including Interstate Highways.

- *Surface Transportation Program (STP)* funds may be used for construction or non-construction projects that benefit bicycles and pedestrians. “Non-construction” projects are items such as maps, brochures, and public service announcements. These funds may be programmed to bring sidewalks and intersections into compliance with ADA regulations.

- Ten percent of STP funds are earmarked for *Transportation Enhancement Activities (TEAs*). The list of activities that are eligible under the TEA program, include the following:
  - Pedestrian and bicycle facilities
  - Pedestrian and bicycle safety and education activities
  - Acquisition of scenic easements and historic easements and sites
  - Scenic or historic highway programs including tourist and welcome centers
  - Landscaping and scenic beautification
  - Historic preservation
  - Rehabilitation and operation of historic transportation buildings, structures or facilities
  - Preservation of abandoned railway corridors
  - Control and removal of outdoor advertising
  - Archaeological planning and research
  - Mitigation of highway runoff and provision of wildlife undercrossings
  - Establishment of transportation museums

- *Hazard Elimination and Railway-Highway Crossing* Programs account for another 10 percent of a state’s STP funds. These funds should be used to inventory and/or address safety concerns of motorists, pedestrians, and bicyclists.

- *Congestion Mitigation and Air Quality (CMAQ) Improvement Program* funds are similar to STP funds in that they may be used for construction or non-construction projects that benefit bicyclists and pedestrians.

- *Recreational Trails Program (RTP)* funds are different from other Federal Aid programs for bicycles and pedestrians in that they are set aside specifically for motorized and non-motorized trails. The RTP funds explicitly prioritize recreational facilities. This program funds acquisition of easements or property for trails, construction of new trails, maintenance and restoration of existing trails, and development of trailhead facilities and trail linkages. In Tennessee, this program is administered through the Tennessee Department of Environment and Conservation. Refer to the State Funding section that follows.

- *The Federal Lands Highway Program* will fund bicycle and pedestrian facilities as a provision of roads, highways, and parkways. This program is under the

discretion of the appropriate Federal Land Agency or Tribal government.

- *The National Scenic Byways Program* funds bikeways and walkways along scenic routes. This program recognizes certain roads as National Scenic Byways or All-American Roads based on their archeological, cultural, historic, natural, recreational, and scenic qualities. There are 72 such designated byways in 32 states. Bicycle facilities can be funded as a component of a corridor's management plan.

- *Job Access and Reverse Commute Grants* may fund bicycle-related services intended to transport welfare recipients and eligible low-income individuals to and from employment.

- *High Priority Projects and Designated Transportation Enhancement Activities* are those projects specifically identified by TEA-21. These projects include bicycle, pedestrian, trail, and traffic calming projects throughout the nation.

- The TEA-21 legislation amended the *Urbanized Area Formula Grants, Capital Investment Grants and Loans, and Formula Program for Other than Urbanized* Area transit funds, part of the Federal Transit Program, to include projects that improve bicycle and pedestrian access to transit facilities and vehicles. One of the activities that qualify for funding is the provision of bicycle storage facilities and pedestrian walkways and access.

- *State and Community Highway Safety Grants* are part of the Section 402 formula grants for which each state is eligible. States must submit a Performance Plan that establishes goals and performance measures for improving highway safety, including improved bicycle and pedestrian safety.

While TEA-21 prioritizes bicycle and pedestrian projects that will benefit the transportation system as a whole (a circular path within a park, for instance, is not used for transportation but for recreation), it does not define "transportation" so narrowly that recreational trips are not eligible for funding. The TEA-21 legislation allows states some leverage to set their own priorities in terms of what types of bicycle and pedestrian projects they will fund. Some states have utilized their TEA-21 dollars to fund projects that will primarily benefit commuters. These grant programs require that states estimate the air quality benefit of their projects.

Typically, TEA 21 funds provide 80 percent of a project's cost with 20 percent of the funds required from local funds.

Federal funding programs, in addition to the TEA-21 programs are discussed below.

Environmental Protection Agency. Federal sources of funding for bicycle facilities have been available through the EPA's Office of Transportation and Air Quality. One such grant source under the EPA's OTAQ is Clean Air Transportation Communities: Innovative Projects to Improve Air Quality and Reduce Greenhouse Gases. These funds assist in the funding of innovative pilot projects to reduce transportation-related emissions of criteria pollutants and greenhouse gases by decreasing vehicle miles traveled and increasing use of cleaner technologies. Eligible recipients are state, local, multi-state, and tribal agencies involved with transportation/air quality and/or climate change issues. The use of federal air quality monies was utilized in Billings, MO for implementation of bike trails using the idea of increased number of bicycles as non-polluting vehicles as justification for obtaining air quality grants.

A second source of EPA funds is through the Congestion Mitigation and Air Quality (CMAQ) funding, as discussed above under TEA-21 programs. These funds have been used for bicycle related projects in many states.

An additional potential source of funds relating to outreach and public education is the EPA's Mobile Source Outreach Assistance Competition. This funding source focuses on outreach and public education relating to cleaner air and alternative transportation. These grants have a $100,000 maximum with a 40% required local match.

Federal Public Lands Highways Discretionary Fund. In 2001, trail projects received $4 million

from the Public Lands Highways Discretionary Fund. This year, bicycle and pedestrian trails providing access to or within federal lands are again eligible for funding.

Community Development Block Grant. The CDBG program directly funds cities and towns for projects with community-wide benefits. Entitlement funds provide assistance with neighborhood revitalization and economic development. Eligible activities must benefit low to moderate-income persons or aid in preventing or eliminating slums and blight. Routes and trails can qualify for CDBG money, particularly those with documentable economic, cultural and historic merits.

For communities, which are non-eligible for entitlement funds based on population, the Small Cities Program Funds serves a similar role for neighborhood revitalization. In Chattanooga, these funds are distributed through the Department of General Services.

Rivers Trails and Conservation Assistance Program. RTCA is a program of the National Park Service. The program does not provide funding for projects, but rather it provides valuable on-the-ground technical assistance, from strategic consultation and partnership development to serving as liaison with other government agencies. Communities must apply for assistance.

American Battlefield Protection Program Funds. This is a program of the National Park Service to support the restoration and preservation of battlefields. Eligible battlefields can be preserved as open space with applicants being local or state government and nonprofit organizations.

Brownfield Redevelopment. The Brownfields Redevelopment Initiative provides funds and loan guarantees to clean up and redevelop environmentally contaminated industrial and commercial sites, commonly known as brownfields. Pittsburgh, Pennsylvania cleaned and revitalized Herrs' Island, which included a trail that circled the Island and connected it to the downtown district.

National Endowment of the Arts. Many organizations seek ways to incorporate more of their community into their trail and bike planning. One way to do this is to celebrate the cultural and historic uniqueness of communities. There are many funding opportunities for these types of projects. The National Endowment of the Arts funds arts-related programs through the Design Arts Program Assistance, and provides many links to other federal departments and agencies that offer funding opportunities for arts and cultural programs.

State Funding

Tennessee Department of Environment and Conservation. TDEC's Recreational Educational Services is responsible for administering federal and state grant programs to local and state governments. The Division manages the Land and Water Conservation Fund (LWCF), the Local Parks and Recreation Fund (LPRF) Grant Program, the Natural Resources Trust Fund (NRTF) and the Recreation Trails Program (RTP). The programs listed below have a match requirement and specific regulations for the applicants.

Through *Land and Water Conservation Funds (LWCF)* grants, approximately $1.67 million dollars was allocated for 2001-2002. This federal grant program is for the purpose of funding state and local governments' outdoor recreation projects.

The *Local Parks and Recreation Fund (LPRF) Grant Program* has been awarding grants to eligible local governments for the purchase and development of land since 1992. Through 1999-2000, $22,350,935 was awarded and $7.6 million was anticipated to be awarded for the year 2001-2002.

The *Tennessee Recreation Trails Grant Program* was established to distribute funds for recreation trail projects. Funds can be granted to government agencies, trail-using organizations and private individuals. This grant is reviewed by the Tennessee Recreation Trails Advisory Board. Past funding was available through the National Recreational Trails Fund Act of 1991.

The *Recreation Trails Program (RTP)* is one of three grant programs administered by the State of Tennessee for the acquisition, development and/or rehabilitation of motorized, non-motorized, and multi-use recreation trails for

activities. Federal, state, and local governments are eligible to apply.

Healthy Communities Funding. Many state health departments recognize the benefits that trails have on communities and actively promote trail-building. Partnering with the state health department is a great way to promote the bicycle system and educate your community about the health benefits.

Local Funding

Transportation Improvement Program. The implementation of a bicycle system is least costly to perform when combined with general construction and maintenance transportation projects, such as scheduled resurfacing. The plan calls out segments of roadways which are scheduled for long range transportation plan improvements, though regularly scheduled improvements to roadways should also be carefully noted and bike planning should "piggyback" on these improvements.

Special Taxes and Bonds. Many communities have raised money through self-imposed increases in taxes and bonds. For example, Pinellas County residents in Florida voted to adopt a one-cent sales tax increase, which provided an additional $5 million for the development of the overwhelmingly popular Pinellas Trail. Sales taxes have also been used in Alleghany County, Pennsylvania and in Boulder, Colorado to fund open space projects.

A gas tax is another method used by some municipalities to fund public improvements.

On the statewide level, residents of Ohio passed the Clean Ohio Fund this year, which authorizes the General Assembly to pass a bill to allow up to $200 million in bond funds to be available for environmental clean-up, farmland preservation, green space preservation, stream and watershed protection and trail development.

Billings, Montana used the issuance of a bond in the amount of $599,000 to provide the matching funds for several of their TEA-21 enhancement dollars. Austin, Texas has also used bond issues to fund a portion of their bicycle and trail system.

Impact Fees. Some communities provide for impact fees that require residential, industrial and commercial development project leaders to provide sites, improvements and/or funding for developing public improvements like open space and trails. Impact fees may be allocated to a particular trail from land development projects in all other areas of a county or city if the fund is a dedicated account established to help develop a county- or city-wide system of trail projects.

Partnerships. Another, often overlooked, method of funding bike systems and greenways is to partner with public agencies and private companies and organizations. Partnerships engender a spirit of cooperation, civic pride and community participation. The key to the involvement of private partners is to make a compelling argument for their participation. Major employers and developers should be identified and provided with a "Benefits of Biking"-type handout for themselves and their employees. Very specific routes which make those critical connections to place of business would be targeted for private partners' monetary support, but only after a successful master planning effort. People rarely fund issues before they understand them and their immediate and direct impact.

Potential partners include major employers which are located along or accessible to bicycling routes, lanes or multi-use paths. Name recognition for corporate partnerships would be accomplished through signage along designated portions of a bike route or lane, or through signage trailheads or interpretive signage along greenway systems. Potential partners in the area include Coca Cola, McKee Bakeries, Erlanger Medical Center, Provident Mutual, the University of Tennessee at Chattanooga and others.

Utilities often make good partners and many trails now share corridors with them. Money raised from providing an easement to utilities can help defray the costs of maintenance. It is important to have a lawyer review the legal agreement and verify ownership of the sub-surface, surface or air rights in order to enter into an agreement.

Exactions. Exactions are similar to impact fees in that they both provide facilities to growing communities. The difference is that through exactions it can be established that it is the

responsibility of the developer to build the greenway or bicycle facility that crosses through the property, or adjacent to the property being developed. This method has been used in Collierville, Tennessee and in Hendersonville, Tennessee. Exactions can also be assessed based on size and type of development.

Non Profit Organizations

The Eastman Kodak American Greenways Fund. a partnership project of Kodak, The Conservation Fund, and the National Geographic Society, provides small grants to stimulate the planning and design of greenways in communities throughout America. The annual awards program was instituted in response to the President's Commission on Americans Outdoors recommendation to establish a national network of greenways. Made possible by a generous grant from Eastman Kodak, the program also honors groups and individuals whose ingenuity and creativity foster creation of greenways. Grants may be used for activities including the following:

- Mapping, ecological assessments, surveying, conferences, and design activities
- Developing brochures, interpretative displays, audio-visual productions or public opinion surveys
- Hiring consultants, incorporating land trusts, building a foot bridge, planning a bike path, or other creative projects

In general, grants can be used for all appropriate expenses needed to complete a greenway project including planning, technical assistance, legal and other costs. Grants may not be used for academic research, general institutional support, lobbying, or political activities. Applicants are primarily local, regional, or statewide nonprofit organizations. Although public agencies may also apply, community organizations receive preference. The maximum grant is $2,500. However, most grants range from $500 to $1,000.

Bikes Belong Coalition. The Bikes Belong Coalition is sponsored by members of the American Bicycle Industry. Their mission is to put more people on bikes more often. They assist local organizations, agencies, and citizens in developing bicycle facility projects that will be funded by TEA-21. Bikes Belong has awarded over $400,000 in grants, with a return of over $200 million in funding for bicycle facilities.

Bikes Belong Coalition accepts applications for grants of up to $10,000 each, and will consider successor grants for continuing projects, subject to policy guidelines. Funding decisions are made on a rolling basis. Applications and proposals are reviewed under the auspices of the Bikes Belong Coalition's Executive Director and the Grant Review Committee, and presented to the Board of Directors for approval, rejection, or resubmission. The Coalition considers grants from local organizations, agencies, and communities in developing bicycle facilities projects.

The Robert Wood Johnson Foundation. The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grantmaking is concentrated in four areas:

- To assure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

The Trust For Public Land. Land conservation is central to TPL's mission. Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

- Create urban parks, gardens, greenways, and riverways

- Build livable communities by setting aside open space in the path of growth

- Conserve land for watershed protection, scenic beauty, and close-to-home recreation safeguard the character of communities by preserving historic landmarks and landscapes

TPL's Chattanooga office has been very active in working with Chattanooga's Department of Parks and Recreation in the planning and development of greenways. TPL has also expressed great interest in the development of a bicycle system and could potentially lend technical expertise, fund development assistance and serve as a grantee when feasible for the development of the bicycle plan.

Local Foundations. Many local foundations have provided support for greenway and related initiatives. Local foundations include:

- Lyndhurst Foundation
- Tonya Foundation
- Community Foundation